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目次 CONTENTS

報告 Transactions

84. Sitihei NOMURA, Miocene Mollusca from Yamaguti, Kozai-mura, Igu-gun, Miyagi-ken, Northeast Honsyû, Japan (Published May 20) ………… 55
宮城縣伊具郡小斎村山口産貝化石（摘要）（5 月 20 日發表）…………野村七平 59
85. Hisakatsu YABE and Toshio SUGIYAMA, Note on *Eomontipora*? from the Eocene of the Palau Islands (Published May 20) ………… 60
パラオ群島の始新統産の *Eomontipora*? に就いて（摘要）（5 月 20 日發表）…………矢部長克・杉山敏郎 62
86. Misaburo SHIMAKURA and Kotora M. HATAI, On a Fossil Species of *Lingula* from Hirobuti-mura, Miyagi-ken (Published July 20) ………… 63
宮城縣廣淵村産シャミセンガヒの化石（摘要）（7 月 20 日發表）…………島倉巳三郎・畑井小虎 67
87. Hisakatsu YABE and Toshio SUGIYAMA, *Marinduqueia mirabilis*, gen. et sp. nov., a Sponge-like Fossil from the Eocene Limestone of Marinduque Island, Philippine Islands (Published July 20) ………… 68
フィリッピン群島マリンドウチ島始新統石灰岩産の海綿狀化石 *Marinduqueia mirabilis* 新屬新種に就いて（摘要）（7 月 20 日發表）…………矢部長克・杉山敏郎 71
88. Kotora M. HATAI and Syôzô NISIYAMA, On Some Fossil Species of *Cancellaria* from Japan (Published July 20) ………… 72
日本産コロモガヒ屬（*Cancellaria*）の化石に就きて（摘要）（7 月 20 日發表）…………畑井小虎・西山省三 74
89. 新潟縣小千谷町東方野邊川谷に發達する第三系の有孔蟲化石群に就いて（8 月 20 日發表）…………大炊御門經輝 75
Tuneteru OINOMIKADO, On the Foraminiferal Fauna of the Tertiary Sediments along the Nobe Valley, Niigata Prefecture (Résumé) (Published August 20) ………… 79
90. Seidô ENDÔ and Haruo OKUTSU, Fossil Cones of Balsam Fir from Sendai (Published August 20) ………… 81
仙臺産 *Abies* 屬化石毬果（摘要）（8 月 20 日發表）…………遠藤誠道・奥津春生 83

記事 Proceedings ………… 84

日本古生物學會報告

(Transactions of the Palaeontological Society of Japan)

84. *Miocene Mollusca from Yamaguti, Kozai-mura, Igu-gun, Miyagi-ken, Northeast Honsyû, Japan*

By

Sitihei Nomura

(Read June 11th; received December 17th, 1938)

The present paper deals with a few species of the Miocene mollusca collected from the sandstone bed developed at Yamaguti, Kozai-mura, Igu-gun, Miyagi Prefecture, along the western foot of the northern end of the Abukuma mountain range; this is a new locality.

The distinguished species are: *Anadara abdita* (Makiyama), *Ostrea gravitesta* Yokoyama, *Tapes siratoriensis* (Otuka), *Polinices coticazae* Makiyama, *Natica janthostoma* Deshayes, *Babylonia kozaiensis* n. sp. and *Siphonalia spadiceoides* n. sp.

The fauna though small in specific number, is of special interest because it indicates the lower half of the Japanese Miocene on the one hand, and increases the knowledge of the Miocene fauna on the other. With additional new localities, ur knowledge on the Miocene geography will be increased. The precise accounts are given in the following lines.

Anadara abdita (Makiyama)

Pl. 13 (8), Figs. 1-7b.

Arca (*Anadara*) *abdita* Makiyama, Mem. Coll. Sci., Kyôto Imp. Univ., Ser. B, Vol. 2, No. 3 (8), p. 152, pl. 12, fig. 11, 1926.

Type locality:—Nanseki, Kankyô-dô, Tyôsen (Heiroku-dô formation); Lower Miocene.

The dimensions are all of left valves, as the types were described and measured by left valves only. The types are said to have 29 to 32 radiating ribs, and one of them measures: length 39 mm., height 30.5 mm., thickness of a valve 14 mm., hinge margin 27 mm., being slightly larger, and having a larger number of ribs than the present material.

This species is very closely related to *A. subcrenata* (Lischke) in the crenulate nature of the surface of the left valve, but may be distinguished from Lischke's species according to Makiyama, "in having the gently arcuating antero-ventral margin and the less produced and less oblique posterior end which is narrowly rounded. The ribs of *A. subcrenata* are round-topped while those of the present species are often obscurely dichotomous." Furthermore the shell appears

Dimensions of plesiotypes (in mm.)

Length	Height	Depth	Length of hinge	Number of ribs
?	28.1	13.0	28.0	26
ca. 30.0	26.0	ca. 10.0	?	?
?	24.0	ca. 10.0	ca. 22.0	24 ?
29.6	21.5	ca. 8.0	ca. 21.0	24
28.8	ca. 20.0	ca. 11.0	ca. 20.0	25
27.2	19.5	ca. 8.0	?	23
26.0	19.0	8.0	17.0	24
25.8	19.0	ca. 8.0	ca. 18.0	24
24.8	ca. 18.0	ca. 6.0	?	27
ca. 25.0	16.5	ca. 6.0	?	23
20.4	14.0	ca. 6.0	?	24
?	12.0	ca. 5.5	?	23

to be smaller in the fnll adult stage as compared with *A. subcrenata.*

In the present collection were found specimens, which are considered to be thh right valve of the same specics. Fig. 3, shows a typical oblong form, while figs. 5, 7, show the somewhat squarely oval forms.

This square form shows a close resemblance with *A. daitokudoensis* (MAKIYAMA)[1] from Daitoku-dô, Kankyô-dô Tyôsen, occurring in the same horizon as *A. abdita.* Whether *A. daitokudoensis* is conspecific with *A. abdita,* or a distinct species as thought by MAKIYAMA, requires more material. Some of the specimens collected from Kozai-umra, are closely similar to *A abdita* while other simulate *A. daitokudoensis.* This difference, as for as the present specimens are concerned, if due partly to the deformation by subsequent pressure and partly to the equivalved-shell of the species. Further it should be mentioned that the present specimens are insufficiently preserved to show the characteristic angular dorsal margin at the extremities as shown in MAKIYAMA's figure, which is somewhat different from his description in details.

Material:—About twenty specimens, Beg. No. 17384.

Ostrea gravitesta YOKOYAMA

Ostrea gravitesta YOKOYAMA, Jour. Fac. Sci., Imp. Univ. Tôkyô, Sec. 2, Vol. 1, pt. 9, p. 388, pl. 45, figs. 1, 2, 1926.

Type locality :—Kinonezaka, Otomo-mura, Senpoku-gun, Akita-ken (Beds F, or Greenish Tuffite = Daisima beds) ; Lower Miocene.

This heavy and clumsy oyster was first described by YOKOYAMA in the following way:

> "The shell is very large uncommonly thick, elongate or ovate. Surface concentrically rudely corrugated with faint plications. Beak pointed, with a long, triangular ligamental groove below it. height 240 mm., length 140 mm., depth 80 mm., thickness of test 50 mm."

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[1] MAKIYAMA: Op. cit., p. 153, pl. 12, figs. 10, 14, 15, 1927.

O. gravitesta seems to be rather frequent in the Neogene deposits of Japan, and is especially abundant in the Lower Kadonosawa series in Mutu province (Iwate-ken). It has been reported repeatedly from several Miocene deposits of Japan, but its specific validity need further investigation, and may probably disclose interesting features from a palaeontologic view.

At the present locality, a thick-shelled oyster is found very frequently, but since none of them are perfect, they are tentatively referred to *O. gravitesta*.

Material:—Several fragmental specimens, Reg. No. 17370.

Tapes (*Siratoria*) *siratoriensis* (OTUKA)

"*Paphia*" *siratoriensis* OTUKA, Bull. Earthq. Res. Inst. Tôkyô, Vol. 12, Pt. 3, p. 616, pl. 48, figs. 41a, 41b ; pl. 50, fig. 98, 1934.

Paphia (*Venerupis*) *siratoriensis* OTUKA, NOMURA, Saitô Hô-on Kai Mus., Res. Bull., No. 6, p. 215, pl. 17, figs. 34, 35, 1935.

Tapes (*Siratoria*) *siratoriensis* OTUKA, Jap. Jour. Geol. Geogr., Vol. 14, Nos. 1–2, p. 30, pl. 3, figs 1, 2, 1937.

Venerupis (*Siratoria*) *siratoriensis* OTUKA, NOMURA and HATAI, Saitô Hô-on Kai Mus., Res. Bull., No. 13, p. 135, 1937.

Type locality:—Siratori, Nisatai-mura, Ninohe-gun, Iwate-ken (Lower Kadonosawa series); Lower part of the Miocene.

Two valves, large and small, are found in the collection. The larger one (right valve) measures 40 mm. in height, but the length is unknown, as the posterior part is lost. The smaller one is also somewhat imperfect in preservation, but the characteristic surface sculpture is well preserved. It agrees not only with the type and subsequent types given by OTUKA, but also with the specimens collected by the writer from the Miocene of Siogama.

This species is known only from the lower half of the Miocene in Japan.

Material:—Two specimens, Reg. No. 17365.

Polinices (*Neverita*) *coticazae* MAKIYAMA

Pl. 13 (8), Figs. 13a–14b.

Polinices (*Neverita*) *coticazae* MAKIYAMA, Mem, Coll. Sci., Kyôto Imp, Univ., Ser. B, Vol. 2, No. 3, Art, 8, p. 150, pl. 12, fig. 8, 1926.

Natica (*Neverita*) *coticazae* MAKIYAMA, Ibid., Vol. 11, No. 4, Art. 8, p. 223, 1936.

Type locality:—Kinsyô-dô, Kankyô-dô Tyôsen (Mankô-dô formation); Lower part of the Miocene.

Two specimens, both are smaller than the type described by MAKIYAMA in 1926. This species resembles *P. recluziana* (DESHAYES) and *P. didymus* (BOLTEN), but is distinguished from them in the point already stated by MAKIYAMA in the above cited works. This species is also realted to *Polinices kiritaniana* (YOKOYAMA)[1] from the Miocene near Tanagura, Hukusima-ken, but has a less elevated spire.

Material:—Two specimens, Reg. No. 18736.

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[1] YOKOYAMA: Jour. Fac. Sci., Imp. Univ. Tôkyô, Sec. 2, Vol. 3, Pt. 4, p. 201, pl. 12, fig. 2, 1931.

Natica (Tectonatica) janthostoma DESHAYES

Material :—One specimen, Reg. No. 17366.

Babylonia kozaiensis n. sp.

Pl. 13 (8), Figs. 8a, 8b.

Shell rather small, ovate. Whor's about six (?), convex, roundly shouldered above with distinct, but not canaliculate sutures. Last whorl narrowed downward, and not so inflated as in *B. japonica* (REEVE), and somewhat constricted around middle. Aperture narrowly ovate. Umbilical region fractured. Surface smooth except for growth-lines. Height ca. 45 mm, diameter 27 mm.

B. kozaiensis n. sp. is closely related in outline to *B. kozaiensis kokozurana* n. subsp. (Figs. 9a, 9b.) from Kokozura, south of Nakoso, Hukusima-ken, but the former differs from the latter by having a smaller shell with a narrower base; it differs from *B. japonica* (REEVE) (Figs. 10a, 10b.) by the body-whorl being much less inflated and correspondingly the base and aperture are narrower.

The shoulder of *B. kozaiensis* and its subspecies *kokozurana* is more pronounced than that of *B. japonica*. *B. elata* (YOKOYAMA)[1] from the Pliocene of Tôtômi is a large shell having more distinct shoulders and channeled sutures; and is a valid species. *B. kozaiensis*, *B. kozaiensis kokozurana* and *B. japonica* are closely related to each other. The first species is found from the Lower Miocene, the second from the Lower Pliocene, or at least Uppar Miocene, and the third is known only from the Pleistocene to Recent. Although these mentioned species probably from a direct evolutional series. more material is necessary to prove the exact relationship of evolution of *B. japonica* and its ancestor.

Material:—One specimen, Reg. No. 17366.

Siphonalia spadiceoides n. sp.

Pl. 13 (8), Figs. 11a, 11b

Shell small, attaining about 30 mm., in height, moderetely solid, fusiform; apex fractured; spire apparently short, shorter than aperture. Surface of whorls convex, most convex slightly below middle part between sutures, marked by longitudinal ribs and spiral cor 's. Ribs prominent, rounded, somewhat oblique, more or less wider than their interspaces which are shallow and concave-bottomed, almost obsolete on body-whorl, and od not extend into base. Cords subequal on penultimate whorl, unequal on body-whorl, nearly equal ot their interspaces in breadth, about 13 appear on penultimate whorl and about 30 on body whorl including base. Aperture narrow, canal, short, slightly recurved, open widely and truncate at base; outer lip transversely denticulated; anal fasciole very weakly defined. Height ca. 28 mm., diametr 14 mm.

This species resembles *S. spadicea* (REEVE) (Figs. 12a, 12b.), but the shell is smaller, the spire shorter and the aperture narrower. It also differs from *S. prespadicea* NOMURA and ZINBÔ[2], a Miocene species from Yanagawa, Hukusima-ken by the shell being narrower, the plicae stouter, columella less straighter and the revolving corde slightly finner.

Material:—One specimen, Reg. No. 17368.

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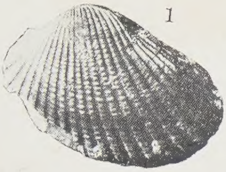
1) YOKOYAMA: Jour. Coll. Sci., Imp. Univ. Tôkyô, Vol. 45, Art. 2, p. 9, pl. 1, figs. 16, 17, 1923.

2) NOMURA and ZINBÔ: Saitô Hô-on Kai Mus., Res. Bull., No. 10 p. 241, pl. 20, figs. 6a, 6b, 1936.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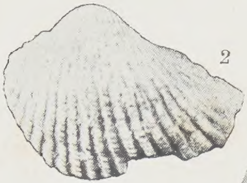
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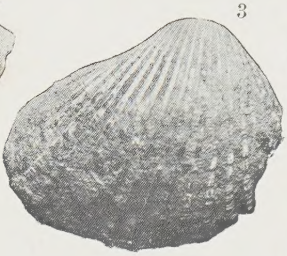
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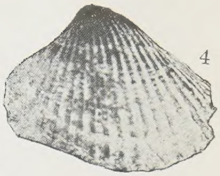
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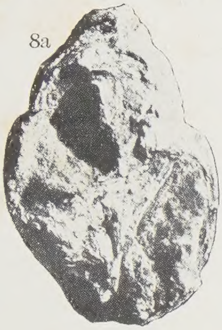
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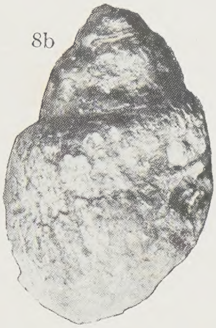
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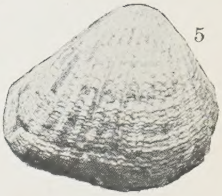
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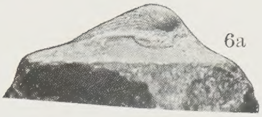
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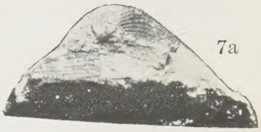
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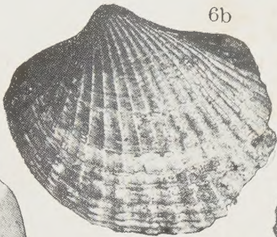
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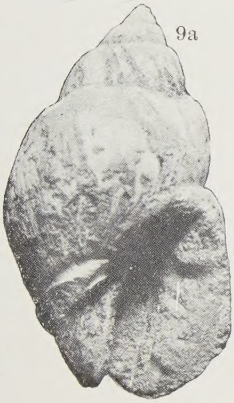
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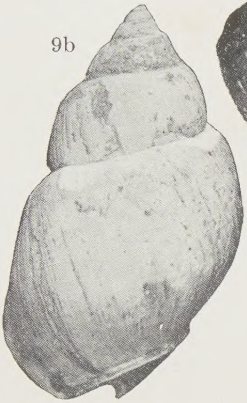
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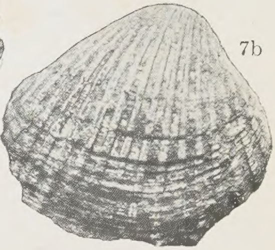
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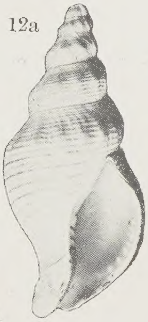
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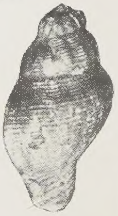
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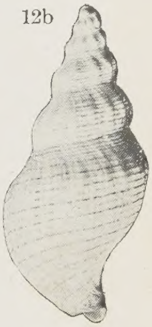
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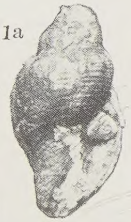
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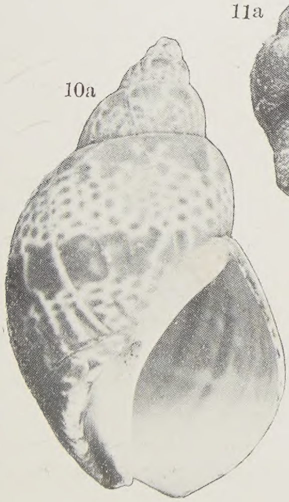
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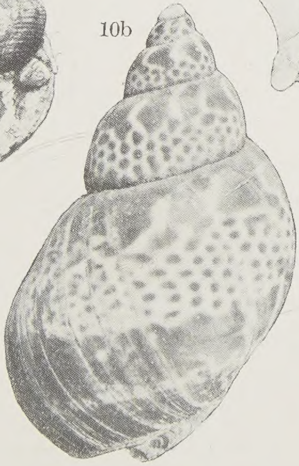
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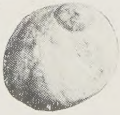
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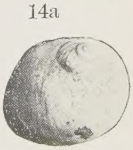
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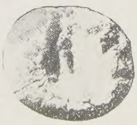
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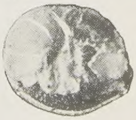
14b

Kamizi photo.

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Explanation of Plate 13 (8)

All figures approximately in natural size

Figs. 1–7b.	*Anadara abdita* (MAKIYAMA)
Figs. 8a, 8b.	*Babylonia kozaiensis* n. sp.
Figs. 9a, 9b.	*Babylonia kozaiensis kokozurana* n. subsp. Kokozura, Hukusima-ken, Reg. No. 3579 for comparison.
Figs. 10a, 10b.	*Babylonia japonica* (REEVE) A living specimen from Onahama, Hukusima-ken for comparison.
Figs. 11a, 11b.	*Siphonalia spadicesides* n. sp.
Figs. 12a, 12b.	*Siphonalia spadicea* (REEVE) A living specimen from Yamagata-ken for comparison.
Figs. 13a–14b.	*Polinices* (*Neverita*) *coticazae* MAKIYAMA

宮城縣伊具郡小齋村山口産貝化石（摘要）

野村七平

化石産地は阿武隈山脈東西の通路である小齋峠の中腹にある。小徑に面し狭い露出であるが貝化石は密集してゐる。硬い砂質凝灰岩中に含まれてゐるので良品を得るに困難であるが，得たるものについて觀察するに，從來日本内地及び朝鮮より中新世代表化石として報告せられたるものを含んでゐるので興味を感じ，玆に報告する次第である。尙ほバイ屬の１新種とミクリガヒ屬の１新種とを記載し *Babylonia kozaiensis*, *Siphonalia spadiceoides* と命名したが，これ等をその現在の類緣種と比較することとについても面白い事が考へられさうである。

85. *Note on Eomontipora? from the Eocene of the Palau Islands*

By

Hisakatsu YABE and Toshio SUGIYAMA

(Read and recieved December 17th, 1938)

Very recently an interesting fossil coral now forming the subject of this note was collected by Mr. S. ENDÔ of our Institute of Geology and Palaeontology, Sendai, from Marukyoku on the eastern coast of Babeldaod, the main island of the Palau Islands. According to him, it is from one of the limestone patches in an agglomerate which is thought to belong to the Babeldaob agglomerte of Mr. R. TAYAMA[1]: this Babeldaob agglomerate likewise contains at its type locality patches of limestone in which *Pellatispira* and several other foraminifera are found. On the fossil evidence, the Babeldaob agglomerate is believed to ba Upper Eocene in age; if the agglomerate of Marukyoku is proved really to be a member of the Babeldaob agglomerate, then the fossil coral now in question should be refered to the same geological age.

The fossil coral at our disposal reveals many features of *Eomontipora harrisoni* GREGORY from the Lower Cretaceous of Esquai, Honduras, which is the genotype of *Eomontipora* established by T. W. GREGORY[2] in 1931, and differs from it only in having horizontan tabulae in corallites; such tabulae are neither mentioned to occur in the description of the Honduras form nor shown in its figuers given by GREGORY.

GREGORY found the genotype of *Eomontipora* to be a coral with montiporoid aspect with distinct, but discontinuous columella, and regular trabecular coenenchyma; further its colony has the upper surface even and finely granulated, but not provided with monticles or spiny processes as is common in most species of *Montipora*. He also assigned to this new genus another species, *Montipora antiqua* GREGORY et TRENCH[3], from the Eocene limestone of the Fly River, New Guinea; the validity of this reference is, however, very doubtfull in our opinion.

The generic diagnosis of *Eomontipora* is given by GREGORY as follows:

> "Monticuliporidae with a massive or branching corallum with a well developed coenenchyma composed of longitudinal trabeculae, which unite by their spines into a network. Columella present in many corallites. No definite wall between the corallites".

The fossil coral from the Palau Islands shows the following features.

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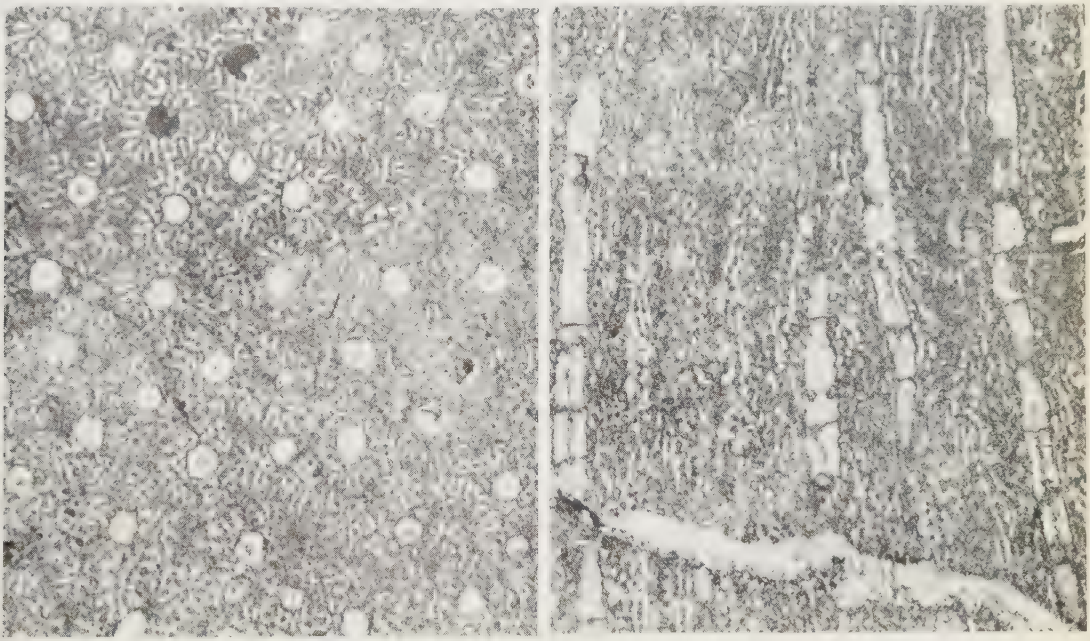
[1] R. TAYAMA: Notes on Morphology, Geology and Coral Reefs of the Palau Islands, Japan. Rep. Inst. Geol. Palaeont, Tohoku Imp. Univ. Vol. 18, p. 11, 1936.

[2] J. W. GREGORY: *Eomontipora*, a New Coral from the Cretaceous of Honduras and the Affinities of the Montiporidae. Ann, Mag. Nat. Hist., Ser. X, Vol. 7, No. 37, 1931.

[3] J. W. GREGORY and J. B. TRENCH: Eocene Corals from the Fly River Central New Guinea Geol. Mag. N. S. Dec. 4, Vol. 3, p. 529, 1916.

Eomontipora? palauensis YABE et SUGIYAMA, sp. nov.

Corallum probably massive, more than 60 mm broad. Corallites circular in cross section, narrow, 0.25 mm broad on an average, usually very regularly spaced, each space about twice the diameter of corallites. Septa either rudimentary being more traces, or absent, numbering up to 12 when present. Proper wall absent. Columella discontinuous, occasionally lacking for a considerable length, straight, circular in cross section, narrow, 0.05–0.1 mm broad. Tabulae horizontal, thin, not always disposed at uniform intervals, in general 0.6 mm apart, but sometimes absent for a length up to 2 mm. Coenenchyma well developed, composed of longitudinal trabeculae which are discontinuous and united by horizontal bars, uniformly broad, being less than 0.05 mm in breadth. Surface feature of corallum unknown, but probably minutely granulated all over; calicular features also quite unknown.



Eomontipora (?) palauensis sp. nov. from Marukyoku, Babeldaob; Eocene? ×15
1. longitudinal section; 2. tangential section

Remarks: As stated above, the Palau fossil can be interpreted as an *Eomontipora* with horizontal tabulae; it differs from the genotype, *E. harrisoni*, by having corallites which are much narrower and more distant, and coenenchyma which is composed of much slender trabeculae and dense.

Tabulae are sometimes very thin in hexacorals and their presence and absence in fossils often entirely depends on preservation. While examining thin sections of recent corals under the microscope, it is often found that tabulae occassionally occurs in a part of stock of corals to which they are habitually lacking. In the case of *Eomontipora harrisoni* there is no mention of their occurrence, nor are they visible on its figures given by GREGORY. However, the common occurrence of them in our coral which agrees very well with *E. harrisoni* in other essential features, remind us that their absence in the latter may possibly be ascribed to an unfavourable preservation of the specimen. Whether the Honduras and Palau fossils are really congeneric or not is left for a while unsettled, and the latter is provisionally assigned to *Eomontipora* with query.

Montipora antiqua from New Guinea was transfered by, GREGORY to *Eomontipora*, on account of its possession of columella, of the great abundance of coenenchym and more regular arrangement of its trabeculae. The original description and figures, however, show that this coral bears a closer resemblance to *Montipora* than to *Eomontipora*, because its columella is a kind of pseudocolumella built of inner ends of septal trabeculae, and not a rod-like primary structure, and further its coenenchymal tissue is more continuous.

The differences existing between our Palau fossil and the common living species of *Montipora* can be summarized as follows:

1. Coenenchymal tissue is considerably denser in *Eomontipora* (?) than in *Montipora*.
2. Trabeculae of coenenchyma are somewhat lamellar in the latter genus and filamentous in the former, which stands nearer *Porites* in this respect.
3. While septal spines are more or less well developed in the latter genus, only mere trace of septa are recognizable in the former.

Corallites of small size in the present fossil seems to correspond to the minute structure of the coenenchymal tissue.

Locality: Marukyoku on the east coast of Babeldaob, the main island of the Palau islands. The single specimen examined is stored in the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai; Reg. No. 63068.

Geological age: Eocene ?

パラオ群島の始新統産の *Eomontipora ?* に就いて （摘要）

矢部長克・杉山敏郎

最近遠藤誠道理學士によつてパラオ群島のバベルダオブ島の東海岸に發達する集塊岩中の石灰岩（始新統？）から興味ある造礁珊瑚の標本が齎らせられた。研鏡の結果 GREGORY が嘗て Honduras の下部白堊紀石灰岩から報告した *Eomontipora* に同定出來る樣である。尤もパラオ種には珊瑚體に床板があるが Honduras 種には之が無いので正確な同定には多少疑問がないでもない。併し後者の標本は前者のに比較して保存不良で或は床板があつたのが保存されなかつたのではなからうかと云ふ疑問が起つて來る。同屬に同定される別種が New Guinea の始新統からも產出することを GREGORY は指摘してゐるが，之は *Eomontipora* とは異つた內部構造を示し同氏が最初述べた樣に *Montipora* に入れべきであらう。

斯樣に極めて類似の構造を示し恐らくは同一屬に入るのではなからうかと考へられる造礁珊瑚が一方は大西洋の下部白堊紀層から他方は太平洋の始新統(?)から產することは興味ある事實である。

86. *On a Fossil Species of Lingula from Hirobuti-mura, Miyagi-ken*

By

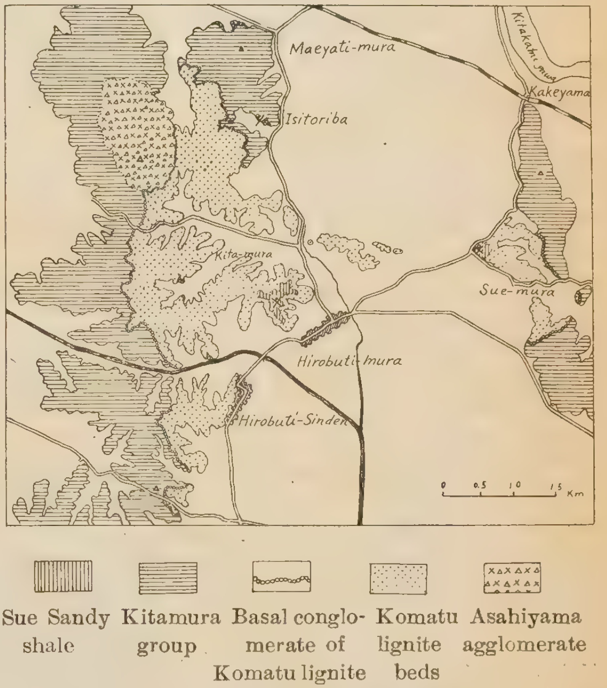
Misaburo SHIMAKURA and Kotora M. HATAI

(Read December 17th, 1938; received February 18th, 1939)

The present article was written at the request of Mr. Yutaka INAI of our Institute of Geology and Palaeontology, Tôhoku Imperial University, who is now studying the stratigraphy of the southern part of the Kitakami Mountainland, at the expense of the Saito Ho-on Kai Foundation, Sendai.

The present writers offer their warmest thanks to Prof. H. YABE of the Institute of Geology and Palaeontology, Tôhoku Imperial University, for the permission to publish this article. The writers also offer their thanks to the Saito Ho-on Kai Foundation, under whose expense the work was done.

The fossil locality of the present specimens (Reg. No. 63167) is from a small exposure on the hilltop behind the small village of Hirobuti in Monô-gun, Miyagiken. The stratigraphical position of the beds which yielded the specimens, in descending order, is as follows (Text-figure 1).



Hirobuti group:—This overlies the next older Kitamura group unconformably and consists of the following beds which are fairly wide in distribution.

Sue sandy shale beds:—composed mostly of compact sandy shale and tuffaceous shale, with abundant remains of marine fossils. The lower part intercalates layers of loose sandstone with *Lingla.*

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* Stratigraphical Studies of the Southern Part of the Kitakami Mountainland, Japan. Contribution No. 3.

Komatu lignite beds:—alternating layers of cross-bedded sandstone, tuffaceous sandstone, tuffaceous shale and tuff. Tuffaceous sandstone predominating in the larger part, with occasional layers of shale and lignite seams.

Basal conglomerate:—conglomerate about 10 m thick.

----------non-conformity----------

Kitamura group:—This group non-conformably underlies the Hirobuti group and overlies unconformably (?) the next older; it consists of the following beds.

Mituya sandstone beds:—chiefly composed of cross-bedded loose sandstone, yellowish brown in color and intercalates conglomeratic and tuffaceous sandstone.

Isitoriba tuffaceous sandstone beds:—the tuffaceous rocks of this beds are somewhat calcareous and conglomeratic, and contain abundant remains of marine fossils and some foraminiferas as *Lenticulina moniwaensis* ASANO.

Kakeyama conglomerate:—composed of conglomerate, conglomeratic sandstone, intercalating sandy tuff and conglomeratic tuff. Marine fossils rarely present.

----------unconformity (?)----------

Asahiyama agglomerate beds:—agglomerate beds whose beds is not exposed.

Judging from the stratigraphical sequence of the different strata and their fossil content (not yet published), it is almost without doubt that the Sue sandy shale beds can be correlated with the Tatunokuti beds[1] in Sendai and its environs, and that the next older Komatu lignite beds correspond to the Lower Umoregi beds, while the Isitoriba tuffaceous sandstone beds may correspond to a part of the Moniwa beds in the environs of Sendai.

Genus *Lingula* BRUGUIÈRE, 1797

Lingula unguis (LINNAEUS), 1758

Pl. 17 (9), Figs. 1–3.

Compare with:—

Lingula anatina DAVIDSON, Trans. Linn. Soc., Ser. 2, Vol. 4, Pt. 3, p. 206, text-figs. 21–23, pl. 29, figs. 1–8, 1888.

Lingula unguis DALL, Proc. U. S. Nat. Mus., Vol. 57, No. 2314, p. 262, 1920; THOMSON, Brach. Morph. Gen., p. 124, fig. 35, 1927; HATAI, Bull. Biogeogr. Soc. Jap., Vol. 7, No. 13, p. 318–322, figs. 1–4, 1937.

Definition:—

" Valves subequal, the ventral slightly the longer, slightly gaping at both ends, elongate, oval, or oblong, with a posterior acumination and a nearly straight front interrupted by a small anterior projection due to small rounded anterior median fold; test smooth, thin, formed of alternating chitinous and phosphatic lamellae, thicker over the visceral cavity, shrinking and warping somewhat on drying; colour green to coppery-brown or red. Ventral valve with a small area, interrupted by a median triangular pedicle-groove; dorsal valve with a small uniterrupted area; beaks of both valves apicate, very short; pedicle long and muscular, protruding between the two beds, and attached to the groove in the area of the ventral valve. Muscular impressions strong, bnt usually indistinct; there are twelve on each valve, somewhat asymmetrically arranged, forming an elongate lozenge-shaped area extending about two-thirds the length of the valve, over which parts the shell is thicker and more predominantly phospatic. The brachia are strong and fleshy, without any clacareous support or spicules, and are spirolophus, with six to seven coild directed dorsally and somewhat inwards." (THOMSON, 1927).

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[1] S. NOMURA and K. HATAI, Saito Ho-on Kai Mus., Res. Bull., No. 10, pp. 284–289, 1936. Papers concerning the fossil fauna of the various beds in the vicinity of Sendai will appear in succession.

The present specimens which are figured in the accompanying plate, comprise only incomplete isolated valves, probably of different individuals. However, the general outline of the valves, approximate convexity and the concentric growth lines can be observed. Judging from the preserved features, the present specimens are taken to belong to *Lingula unguis* (LINNAEUS), Figs. 4–7, a species which is widely distributed in the Indo-Pacific region, being particularly abundant in the Philippine Islands and certain parts of southern Japan[1]. This species is better known under the name of *Lingula anatina*. Probably perfect specimens would require a new name for our specimens, seeing that it also shows considerable resemblance to *L. shantungensis* HATAI[2] a species, Figs. 8–10, from Eastern Shantung, China.

Records of the occurrence of the genus *Lingula* from the Neogene and younger deposits of Japan are very few, and it is interesting to notice that the majority of the records are from Pleistocene deposits. M. YOKOYAMA,[3] S. TOKUNAGA[4] and K. SUZUKI and F. TAKAI[5], have all recorded *Lingula hians* SWAINSON from Pleistocene deposits. The first two authors record that species from the Pleistocene deposits at Ôzi in Tokyo, while the latter two record it from the environs of Takomati in Tiba Prefecture. M. YOKOYAMA[6], also records the same species from the Pliocene deposits of Onma, Nagaya and Kakuma in the outskirts of Kanazawa city, Isikawa Prefecture, where are developed the well known Pliocene Onma beds.

Lingula hians SWAINSON is now generally accepted as being a synonym of *Lingula rostrum* (SHAW), ang if the previous records are really of *L. hians* or more correctly *L. rostrum*, then the known geological range is from the Lower Pliocene to the recent seas. However, what M. YOKOYAMA[7] figures as *L. hians* in 1927, appears to be closer to *L. unguis* (LINNAEUS)[8] in having a nearly straight front margin, a squarely developed anterior half of shell and by the general tapering of the sides of the valves posteriorly. *Lingula unguis* (LINNAEUS), is better known as *L. anatina*. However, whether the *Lingula hians* of previous authors above mentioned is the same as *Lingula rostrum* (SHAW), or synonymous with *L.*

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1) K. HATAI, Bull. Biogeogr. Soc. Japan, Vol. 6, No. 8, p. 65, 1936.
2) K. HATAI, Bull. Biogeogr. Soc, Japan, Vol. 7, No. 13, p. 322, figs. 5–7, 1937.
3) M. YOKOYAMA, Jour. Fac. Sci., Imp. Univ. Tokpo, Sec. 2, Vol 1, Pt. 10, p. 403, 1927.
4) S. TOKUNAGA, Jour. Coll. Sci., Imp. Univ. Tokyo, Vol. 21, Art. 2, p. 69, 1906.
5) K. SUZUKI and F. TAKAI, Jour. Geol. Soc. Tokyo, Vol. 42, No. 496, p. 13, 1935.
6) M. YOKOYAMA, Op. cit., Vol. 2, Pt. 4, p. 170, 1927.
7) M. YOKOYAMA, Op. cit., 1927.
8) T. DAVIDSON, Trans. Linn. Soc., Ser. 2, Vol. 4, Pt. 3, p. 206, pl. 29, figs. 1–8, 1888.

unguis (LINNAEUS) or *L. muraphiana* REEVE[1], is a matter open to question, although *L. unguis* appears to be the closest one.

Lingula is an interesting genus from both a biological and palaeontological standpoint and from a view-point of geology, its presence in strata or stratum serve to help in alalysing the past conditions. Further, the approximate depth of sedimenation of the strata or stratum yielding the *Lingula* can be also estimated and, the conditions of deposition may also be judged. Owing to having such important bearing on geology it seems worthwhile to give further remarks in concern.

W. H. A. PENSELER[2] has "shown, *Ringula*, is a paleic indicator of some value First, it is a climate-indicator, since at present the genus is confined to tropical and warm-temperate seas; second, it is a habitat-indicator, since Recent lingulids are characteristic of, or dominants in, the shallow water (0–10 fathoms) of estuarine bays and deltas on sandy or muddy bottoms."

C. SCHUCHERT[3], has already given such interesting remarks as," the greatest, variety of species of ligulids and discinids are found in shales and sandstones, and, furthermore, that the physical evidence of the deposits in which such occur is in, harmony with the character of the sediments and the present distribution of the littoral and shore living inarticulates." In later paragraph C. SCHUCHERT states, that, *Lingula* is exposed on the tidal flats of Japan for hours without injury,.... At high tide these animals are covered with 3 to 4 feet of water. Their habitat may be brackish or foul with decomposing organic matter, even to such an extent that all other shell-fish may be killed off. N. YATSU, who has studied living *Lingula,* tells us that on little estuaries in certain bays of southern Japan their habitats may be covered by sand and mud brought down by stream freshets, so that all of the burrowing shell fish will be destoryed, but *Lingula* will still live in such stinking places and the individuals tunnel themselves to the surface. The burrows are from 2 to 12 inches long, and the movements of the animals up and down in the holes are made by means of highly contractile and regenerative peduncle."

From the foregoing lines it may be noticed that *Lingula* is an indicator of temperature, habitat, depth and conditions of sedimentation. Accordingly, its value in fossil state can not be neglected, however, up to the present time it has been given but little attention. To the statements of the foregoing authorities, one more remark must be added. Strictly speaking *Lingula*[4] may be found in temperate seas which are not very warm, but when occurring, its individual and specific number is a small one, being generally limited to a single species.

From the above as well as from the mode of occurrence of the fossil lingulid

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[1] L. REEVE, Conch. Incon., Vol. 13, Pl. 1, fig. 3, 1859; T. Davidson, Op. cit., p. 215, pl. 29, fig. 11, 1888.

[2] W. H. A. PENSELER, cited after R. S. ALLAN, Trans. Roy. Soc. New Zealand, Vol. 65, p. 385, 1936.

[3] C. SCHUCHERT, Bull. Geol. Soc. America, Vol. 22, pp. 263–264, 1911.

[4] S. NOMURA and K. HATAI, Trans. Pal. Soc. Japan, No. 22, p. 809, pl. 46, fig. 6, 1936.

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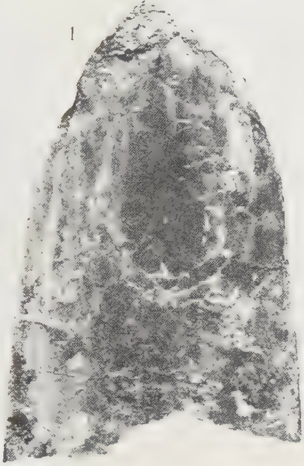

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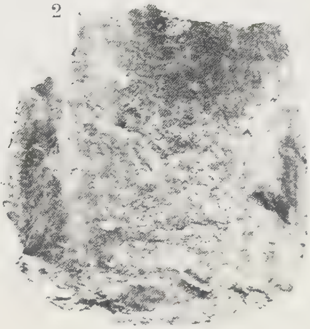

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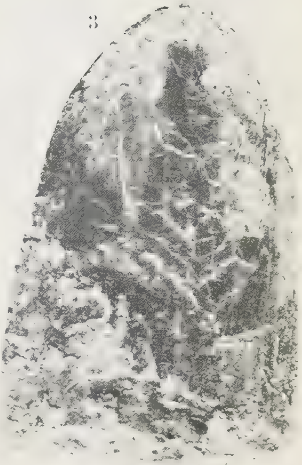

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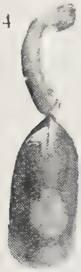

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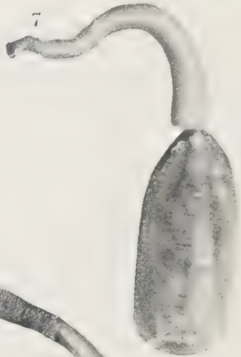

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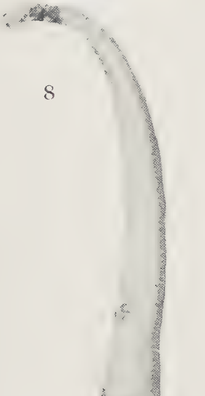

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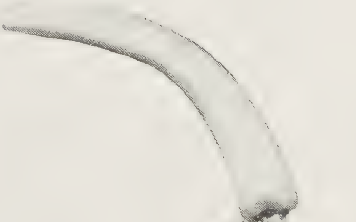

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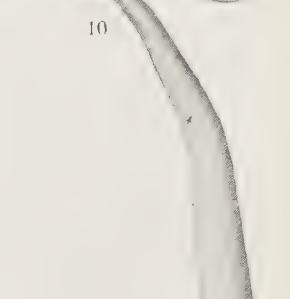

dealt with in this article, it is quite evident that the lowest part of the Sue sandy shale beds in the Hirobuti-mura district, was deposited at a depth of around 0–10 meters and probably not more; an estimated depth of 5 meters may be most reliable. The conditions at the time of flourishing of the fossil lingulid was one of estuary or brackish water. The water temperature may have been nearly the same as that of the present day Isinomaki-wan, adjacent to the fossil locality. If the sea was colder than at present, it appears that the lowest parts of the Sue sandy shale beds may still have been in the influence of warm ocean-currents prior to the cold northern currents which brought a purely northern fauna into the Sue sandy shale beds of a higher horizon. This assumption is based upon the stratigraphical observations in the field and also to the fact that the pure northern fauna of the Sue sandy shale beds occurs in a higher horizon than the lingulid dealt with in this article.

Explanation of Plate 17 (9)

Figs. 1–3. *Lingula unguis* (Linnaeus) (?). Fossil specimens enlarged 2 times. These specimens are tentatively refered to the named species, although they show considerable resemblance to *L. shantungensis* Hatai.

Figs. 4–7. *Lingula unguis* (Linnaeus). Recent specimens in natural size, figured for comparison with the fossil ones.

Figs. 8–10. *Lingula shantungensis* Hatai. Recent specimens in natural size, figured for comparison with the fossil ones.

宮城縣廣淵村產シャミセンガヒの化石 （摘要）

島倉巳三郎・畑井小虎

宮城縣桃生郡廣淵村の一部に分布する須江砂質頁岩層は仙臺市附近に發達する龍ノ口層（下部鮮新統）に對比されるが，その下底に近い砂岩質の部分にはシャミセンガヒの化石を多く含んでゐる．標本は稍ゝ不完全な爲，假りに *Lingula unguis* (Linnaeus) 1758 に固定しておいたが，*L. shantungensis* Hatai に似た點もあり，若し完全な材料が得られたならば新種になるかも知れないものである．尙シャミセンガヒ類は氣候や環境の指示者としても有力であるから，此の點から見た本地層の堆積狀態を論じた．

87. *Marinduqueia mirabilis, gen. et sp. nov., a Sponge-like Fossil from the Eocene Limestone of Marinduque Island, Philippine Islands*

By

Hisakatsu YABE and Toshio SUGIYAMA

(Read and received February 18th, 1939)

Mr. W. HASIMOTO, coming back last autumn from his one year geological works in the Philippine Islands, submitted us several interesting fossils for study. Two of them have already been reported by us in a paper entitled, "Two new Interesting Tertiary Hydrozoa from the Philippine Islands", now in press; these are *Philippinactinia hasimotoi*, which is a Sphaeractinid, aud *Circopora ? laminata*, both new.

Another interesting fossil to which description the present article is devoted, was collected by W. HASIMOTO, from the river Hinalogan, a tributary of the river Boac, Boac, Marinduque Island, and found in a block of limestone. The limestone contains *Camerina, Biplanispira, Discocyclina* and *Spiroclypeus*, and in consequence, the geological age of the present fossil is, without doubt, Eocene.

The fossil is a cyclindrical body, externally annulated and internally provided with a narrow cavity which is apparently uninterrupted and circular in cross-section. The skeletal part around the cavity is relatively broad, consists of sub-parallel, upwardly convex lamellae arranged in a vertical series and converging to for the outer and inner borders of the skeletal part; the lamellae are perforated and connected with one another successively by vertical or radial pillars which are relatively stout and straight. The interlamellar spaces or camerae are spacious and often traversed by thin diaphragms.

The true nature of this curious fossil is still in question; its skeletal part is similar to *Circopora faveolata* "WAAGEN and WENZEL[1], from the Permian *Productus*-limestone of the Salt Range, India, in which, however, the vertical elements are more or less lamellar and irregular, never having regular, rod-like pillars as in the present fossil. On the other hand, the central cavity of the latter strongly reminds us of the cloaca of sponges; but there is no form in our aquaintance of the Porifera with a similar skeletal structure.

It looks somewhat like *Amblysiphonella*[2] from the Permian of the Salt Range,

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[1] W. WAAGEN and J. WENTZEL: Salt Range Fossils. Coelenterata. Paleont. Indica., ser. 13, vol. 1, p. 958, 1887.

[2] W. WAAGEN and J. WENTZEL: Op. cit., p. 972. I. HAYASAKA: *Amblysiphonella* from Japan and China. Sci. Rep. Tôhoku Imp. Univ., Sendai, Japan, vol. 5, no. 1, p. 1, 1918. H. YABE and T. SUGIYAMA: *Amblysiphonella* and *Rhabdactinia* gen. et sp. nov., from the Upper Palaeozoic Limestone of Mimikiri, near Sakawa-mati, Tosa Province, Japan. Jap. Jour. Geol. Geogr., vol. 11, nos. 3-4, p. 175, 1934.

China, Japan, and of several other countries on one hand, and to *Heliospongia*[1] from the Carboniferous of Konsas, North America on the other. *Amblysiphonella* possesses the central hollow and many camerae in a vertical series around it, but has no vertical pillars; further, the walls of camerae are minutely perforated and the pores are of quite different nature from those of the present fossil. The skeletal part of *Heliospongia* is reticulated, and certain species of the genus is somewhat similar to the present one in this respect; but the vertical elements are apparently different in nature from the corresponding ones of ours.

One opinion is that the skeletal part of the present fossil may be interpreted as being spicular, namely the spicules are well developed in one arm, being subparallel and arranged radially, while much reduced in other arms which interlocked with those of the adjacent spicules form common lamellae leaving numerous round spaces or perforations, open; were the skeletal elements really spicular, then they must be thought to have lost completely not only axial canals but also their entire material except for their outline. Actually, the original substances of the skeletal elements are entirely demolished by fossilization, being replaced by calcite and their outline only is shown by a dark fring,

At any rate, there is no organism familiar to us which more or less approaches the Philippine fossil under consideration in external aspect and internal structure; be a sponge or hydrozoa, it may represent a new type and is thought worthy of description under a new generic name *Marinduqueia*.

Marinduqueia, gen. nov.

Genotype:—*Marinduqueia mirabilis*, sp. nov. At present monotypic.

Marinduqueia mirabilis YABE and SUGIYAMA, sp. nov.

Pl. 18 (10), Figs. 1-7.

Body cylindrical, straight, over 60 mm long and up to 22 mm broad; anterior and posterior ends not preserved; externally feebly annulated. Central cavity (cloaca?) narrow, 2-3 mm in diameter, apparently uninterrupted. Skeletal part around central cavity thick, being up to 10 mm broad, composed of two sets of skeletal elements almost at right angle, one set lamellar and the other rodlike. Lamellar ones convex upwards, closely arranged in a vertical series around central cavity and converging toward the outer and inner boundary surfaces of skeletal part, usually 6 lamellae counted in 5 mm where their interspaces are broadest; perforated, pores circular, small, 0.1 mm broad, 6 counted per 2 mm; interlamellar spaces very wide. Longitudinal elements or rods stout, straight, almost circular in cross-section, perpendicular to concentric lamellae, somewhat swollen at and sometimes appearing as if being branched near their junction with concentric lamellae, otherwise uniformly broad, being as broad as 0.15 mm, usually 3 of them counted per 2 mm; always extending in all probability without interruption between 2 successive lamellae, though in longitudinal-section of skeletal part some rods appear to be shorter probably due to slight obliquity of section-plane to their length, or to be exceedingly longer traversing several concentric layers due to demolition of boundary between consecutive rods by fossilization. Thin diaphragms common in interlamellar spaces, varied in orientation and often sinuous.

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[1] G. H. GIRTY: On Some New and Old Species of Carboniferous Fossils. Proc. U.S. Nat. Mus., vol. 34, p. 288, 1908.

Locality:—The river Hinalogan, a tributary of the river Boac, Boac, Marinduque Island, Philippine Islands. 4 fragmental specimens examined, which represent at least 2 individuals; stored in the collection of the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai (Reg. No. 63093).

Geological age:—Eocene.

Finally we wish to express our cordial thanks to Mr. HASIMOTO for his generous offer of this fossil to the Institute for study.

Postscript

Soon after having sent the proceding note to the editor, it was found that Mlle D. le MAITRE[1] described several years ago a very peculiar fossil with the microstructure similar to that of the Philippine form, from the Liassic of Morocco, northwest Africa. It was assigned by her to the spongiomorphid genus *Stromatomorpha* and named *S. californica* J. P. SMITH var. *columnaris*. Its elongate nodular or mushroon-like body consists of numerous subparallel lamellae which appear vermiculated on the surface and are connected to one another by vertical pillars; it bears no calices.

There is some doubt about the generic position of the Moroccan fossil; were the concentric lamelae provided with regular perforations (see her figure 7 on Plate VII) instead of being vermiculated, its resemblance to the Philippine form may be very close.

On the other hand, the generic identity of this fossil and *Verticillites budaensis* WELLS[2] from the lower part of the Buda limestone of Texas is almost beyond doubt, both agreeing each other not only in general form and internal structure, but also in size of various structural elements. WELLS brought his fossil under the genus *Verticillites* DEFRANCE, which has *Verticillites cretaceus* DEFRANCE from the Danian of France as its genotype. We have no specimens at hand of this European species nor of the other congeneric forms and are acquainted only with STEINMANN's original description of the genotype which runs as follows: "Das Innere der Segmente wird von einem lockeren Gewebe erfüllt, dessen Elemente meist senkrecht zur Oberfläche der Segmente orientiert sind. Die Dichte des Gewebes scheint einem ziemlich grossen Wechsel unterworfen zu sein." If this statement is reliable, it is quite evident that the Philippine and American forms are generically distinct from *Verticillites*, because the interlaminar spaces of them are traversed vertically by numerous regular pillars, but not filled up by a loose tissue.

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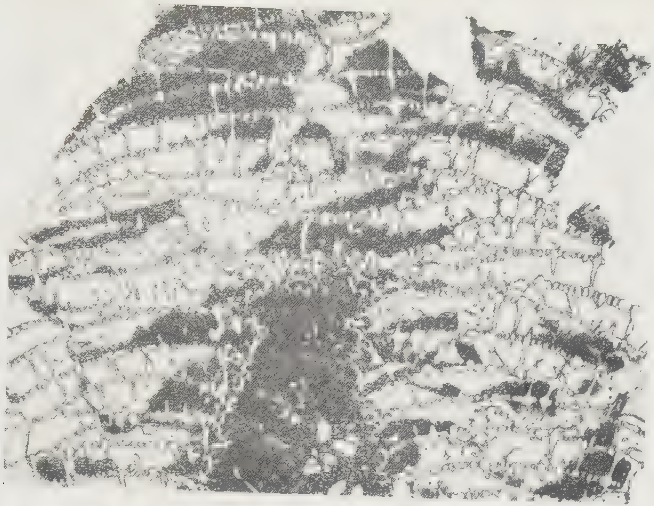
[1] G. DUBAR et D. le MAITRE: Etudes paléontlogiques sur le Lias du Moroc. Spongiomorphides. et Algues. Serv. Mines et de la Carte Gél., Notes et Mém., XXXIV, 1935, p. 41, pl. VII, figs. 3-10.

[2] J. W. WELLS: A New Species of Calcispinge from the Buda Limestone of Central Texas Jour. Palaeontology, Menasha, vol. VIII, No. 2, 1934. 167-168, Pl. XXVII, figs. 1-4.



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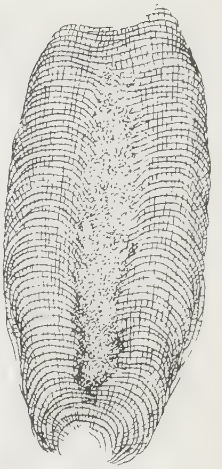

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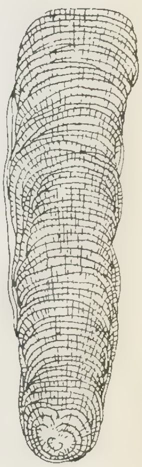

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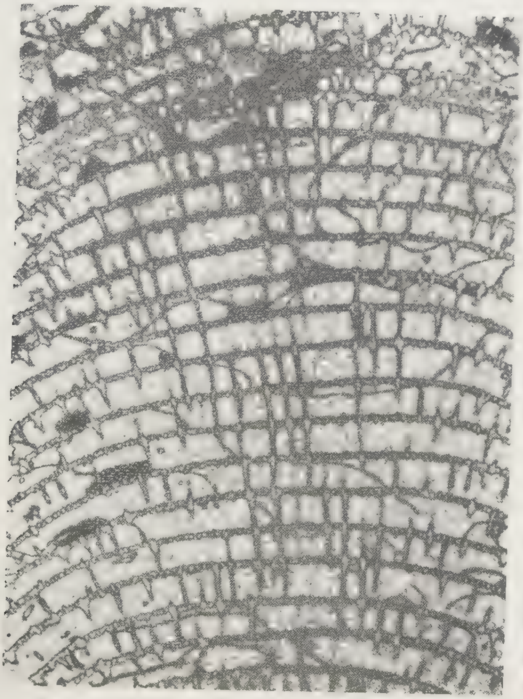

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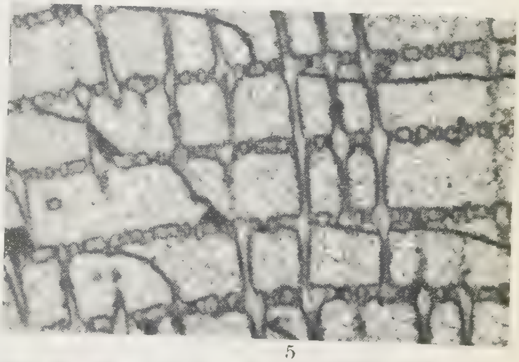

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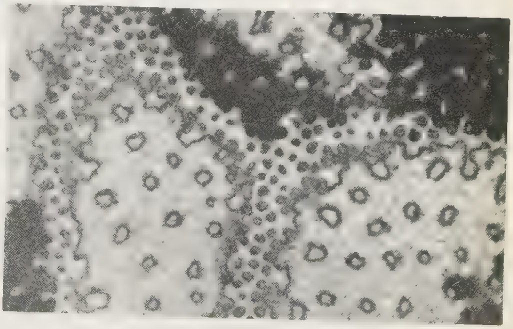

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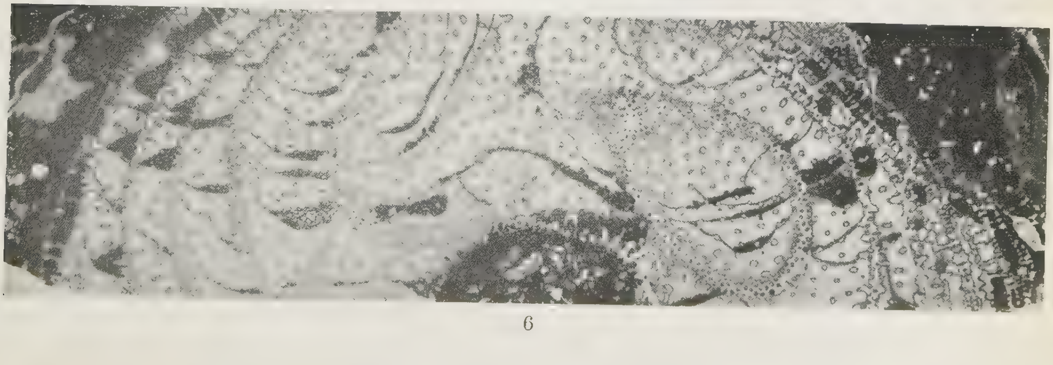


6

Explanation of Plate 18 (10)

Marinduqueia mirabilis YABE et SUGIYAMA, gen. et sp. nov.

Loc. The river Hinalogan, a tributary of the river Boac, Boac, Marinduque Island, Philippine Islands. Eocene. Reg. No. 63093.

Fig. 1. The holotype, polished longitudinally through cloaca ; × ca. 1
Fig. 2. The same specimen, polishod through skeletal part ; × ca. 1.
Fig. 3. More or less longitudinal section through cloaca ; × 5.
Fig. 4. Longitudinal section through skeletal part ; × 5.
Fig. 5. A part of the same enlarged ; × 10.
Fig. 6. Cross section ; × 5.
Fig. 7. A part of the same enlarged ; × 10.

Figs. 1, 2, sketches ; Figs. 3–7, photographs.

フィリッピン群島マリンドウチ島始新統石灰岩産の海綿狀化石 *Marinduqueia mirabilis* 新屬新種に就いて（摘要）

矢部長克・杉山敏郎

橋本亙理學士がマリンドウチ島の始新統石灰岩から採集した化石の形體及び骨格の内部構造は *Heliospongia* や *Amblysiphonella* を多少思はしむる。又 cloaca のあることを除けば水棲動物の *Circopora* に類することは否定出來ない。骨骼が石灰質で，内外兩壁間には無數の圓孔を具ふる數多の平行板狀骨骼，それと直交する多數の細い圓柱狀骨骼並に不規則の形體を示す板狀のシキリよりなり，比較的厚いことが特徴であつて，恐らくは海綿類に入るべきものか。從來知られたる屬に同定出來ない故新屬新種を此處に創設する。

88. *On Some Fossil Species of Cancellaria from Japan*

By

Kotora M. Hatai and Syôzô Nisiyama

(Read October 18th 1938; received April 5th, 1939)

(Abstract)

The number of species of *Cancellaria* from Sikoku, Kyûsyû, Taiwan (Formosa) and Japan proper is not very great. The valid species of the genus, are the following few, namely:—

C. hukusimana Nomura and Hatai
C. kurodai Makiyama
C. nodulifera Sowerby
C. reeveana Crosse
C. spengleriana Deshayes
C. taiwanensis Nomura
C. kobayashii (Yokoyama)
C. macrospira Adams and Reeve
C. pristina (Yokoyama)
C. reeveana laticosta Löbbeck
C. tyosenensis, new species
C. thomasiana Crosse

As the writers have not had the opportunity of study specimens of *C. limatula* Yokoyama, it is here regarded as valid. The species which have been assigned to the genus *Cancellaria*, but most probably represent some other genus, are the following few, namely:—

C. lischkei Yokoyama
C. murayamai Yokoyama
C. longispirata Yokoyama
C. tabatai Yokoyama

These species have been omitted from the present article for reasons stated in the original article, and also to be rejected from the genus, are the following few, namely:—

C. bocageana Crosse and Debeaux of Yokoyama, *C. crispata* Sowerby of Yokoyama, "*C. noduliformis* Sowerby" of Otuka, *C. ozawai* Otuka, a manuscript name, *C. asperella* Lam. var. *reeveana* Cr. of Yokoyama.

The first two species are recognized by J. Makiyama as synonymous with his *C. kurodai*. The third one is not found in the works G. B. Sowerby, and was probably not even described by him, although Y. Otuka mentions such a species. The fourth one is a manuscript name, while the fifth appears to be a young form of a species dealt with in the original article.

Thus restricted, it is found that the results, although at first expected to turn out similar to the previously studied fossil species of *Dosinia* from Japan, show considerable differences. The differences may be explained by the facts that, 1, the present seas of Japan as well as in the youuger Tertiary formations, the individuals of *Cancellaria* is apparently considerably less than that of *Dosinia*, 2, the distribution in fossil state of this gastropod genus is much less than *Dosinia*, 3, more attention has been given to the genus *Dosinia*, and 4, further studies in regard to this gastropod genus is necessaay. Similarity between the two genera are found in such features as, 1, species with a long geological range in time have a wide geographical distribution, compared with species having a shorter chronological distribution, 2, the number of extinct species decreases as the strata of their occurrence becomes young, 3, species with a short geological range in time are generally distributed in living state, to Central Japan and to south, and, 4, the stratigraphical value of both *Cancellaria* and *Dosinia* can not be undervalued, as can readily be seen from their associated fauna as stated in the original article.

Age determination by means of *Cancellaria* alone is not a simple matter and unless two or more species are found from the same horizon, the age can hardly be determinted. However, if as many as four species occur in the same beds, the possiblity of age determination of the beds is much increased. Probably the most reasonable method is the recognition of the following four features, namely, 1, species occurring in one stratigraphic sequence, but without overlapping of their vertical range, 2, the same, but with marked overlapping of their vertical ranges, 3, appearing in succession but not in extermination, and, 4, appearing at the same time but becoming extinct in succession. By fully considering the mothods just stated, the possibility of determining the geological age of the beds which yield this particular gastropod can not be neglected. However, it appears that the time to discuss this problem in full, is not yet ripe. And further data are evidently necessary to bring about conclusive remarks.

In regard to the evironment of *Cancellaria*, our knowledge is hardly worth mentioning. However, it may be stated that the bottom where *Cancellaria* lives generally consists of sand of various texture and nature; being common in bays or enclosed water bodies where the water current is not strong, rather than in the open sea where wave action is considerable. The bathymetrical range is but a slight one, and probably such a depth as 100 fathoms is never reached. The majority of the records range between the strand line to 30 fathoms, although there is one record of 63 fathoms.

As to the number of species, it appears that the Indo-Pacific zoological province may be enumerated in first place for the Far East. In north temperate waters the number of species is much decreased, in other words, it may be said that the number of species is increased from north to south, and vice versa.

The above mentioned data is important in dicussing the depth of deposition of the strata yeilding fossil *Cancellaria*, particularly when the shallow water shells were not carried into deep water by sea waves and other agencies. And also to be taken into consideration as data for such discussions is the state of preservations, especially the degree of wear.

Comparion of the distribution of the living species with those which occur as fossil, is a geat aid in discussion of oceanic currents and migration of the past. Together with the associated fossil fauna of *Cancellaria*, we can know the general physical conditions of the past.

The present work was prosecuted by a grant-in-aid received by the writers from the Saito Ho-on kai Foundation in Sendai, to whom the writers are endebted.

Their thanks are due to Prof. H. Yabe of the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai, for kindly looking over this short note.

日本產ころもがひ屬 (*Cancellaria*) の化石に就きて。（摘要）

畑井小虎・西山省三

從來記載並に報告された日本產 *Cancellaria* 中化石として見出されるものに就きて，整理を試みて得た結果を記したものである。次の 11 種及び 1 亜種が化石として日本に產出すると認められる。即ち

C. hukusimana Nomura aud Hatai, 1936
C. kobayashii (Yokoyama), 1927
C. kurodai (Makiyama), 1927
C. limata Yokoyama, 1928
C. macrospira Adams and Reeve, 1850
C. nodulifera Sowerby, 1855
C. pristina (Yokoyama), 1923
C. reeveana Crosse, 1863
C. reeveana laticosta Löbbecke, 1887
C. spengleriana Deshayes, 1830
C. taiwanensis Nomura, 1935
C. thomasiana Crosse, 1861

尙ほ朝鮮產新種 *Cancellaria tyosenensis* Hatai and Nisiyama を見出した。

尙ほ筆者等の 1 人畑井が先般略々同樣な方法で得た日本產化石 *Dosinia* の結果と *Cancellaria* の夫れとの相違點及び類似點，並にその點等の依つて來ると思はれる原因等に關して論じたものであり，*Dosinia* に比して *Cancellaria* は個體數並種數に於て遙かに劣勢なことは著しいことである。

89. 新潟縣小千谷町東方野邊川谷に發達する第三系の有孔蟲化石群に就いて

大炊御門經輝

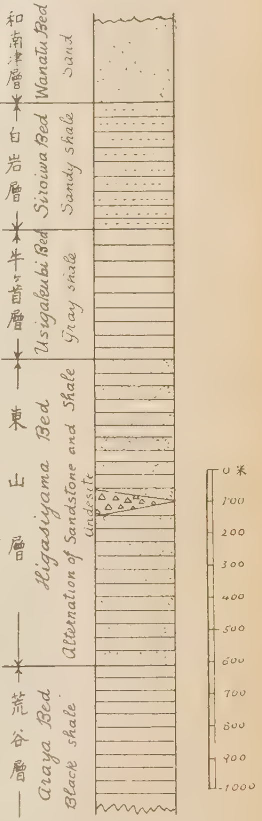
（昭和 13 年 4 月 3 日講演並に受理）

動物界中最も原始的な有孔蟲類の化石が油田開發上重要な役割を演ずることは今さら説明を要しない事である。近年我國に於いても有孔蟲化石の應用方面の研究に大部注意が向けられる様になつた。

筆者は日本石油會社のコアーを調査中可なり多數の有孔蟲を發見したので，コアーの對比並に露頭との比較の必要上，先づ東山油田を構成する地層の大部分を露出する野邊川の谷を選んで有孔蟲化石の採集を行つた。野邊川は新潟縣北魚沼郡小千谷町の東方，鋸山々脈の山中，荒谷附近に源を發して小千谷町の北東方で信濃川に注ぐ 1 小流であるが，前述の様に其の谷には東山油田を構成する地層の大部分が露出してゐるので東山油田を調査する人の一度は訪れることのある谷である。此の附近の地質並に地質構造に關しては大村一藏學士が石油技術協會誌第 5 卷，第 6 號，pp. 347-364（昭和 12 年）に「東山油田」と題して詳細に述べられてゐるので，此處では地質の説明を省き，野邊川谷の入口から荒谷附近迄の露出の地質斷面圖を第 1 圖に掲げて置いた。

有孔蟲化石の材料は谷の入口から荒谷附近迄約 3.5 粁の間に 24 ケ所から採集したが，其の中有孔蟲を檢出したのは 20 ケ所であつた。各地層に就いて云へば白岩層 2 ケ所，牛ケ首層 1 ケ所，東山層 14 ケ所，荒谷層 3 ケ所である。東山層の砂岩頁岩互層に於いては砂岩中には發見されず，頁岩中に多く發見した。是等の採集地點は第 21 (11) 圖版に示してある。白岩層の材料は四鹽化炭素に依り，牛ケ首層以下のものは水洗ひに依つて約 70 立方糎の母岩中に含まれる有孔蟲を選出した後，各種別に其の數を勘定した。

識別した有孔蟲は 15 科，30 屬で，種，亞種，及び未決定種は總計 70 である。其等の有孔蟲及び其の產出頻度を第 1 圖版に掲げて置いた。同圖版中の產出頻度を示す記號を絡ぐ實線は zonal change を示し，點線は白岩層に對比される西山油田の灰爪層に發見されるものである。大部分のものは persistent であるが，同一地層に於ても，產地に依り種の組合せ，產出頻度に可なりの差異が見られる。



Text-Fig. 1. Columnar section along the Nobe-gawa valley.

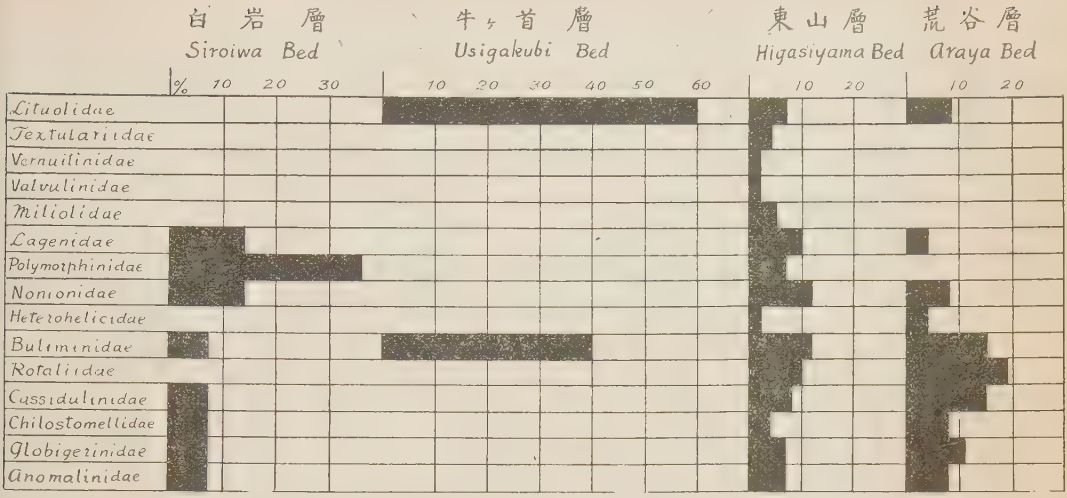
白岩層　第１表に各地層産出の科及び種數を揭げてある。第２表は第１表の各科に屬する種數の同一地層の種總數に對する百分率を示し，第２圖は此の表を圖示したものである。是を見ると

Table 1. Showing the number of families and genera, and the total number of different species, varieties, and indeterminate species in the Siroiwa Bed, the Usigakubi Bed, the Higasiyama Bed, and the Araya Bed. Genus, number of genera. Species, number of different species, varieties, and indeterminate species.

	白岩層 Siroiwa Bed		牛ヶ首層 Usigakubi Bed		東山層 Higasiyama Bed		荒谷層 Araya Bed	
	Genus	Species	Genus	Species	Genus	Species	Genus	Species
Lituolidae	0	0	2	3	2	4	2	2
Textulariidae	0	0	0	0	1	2	0	0
Vernuilinidae	0	0	0	0	1	1	0	0
Valvulinidae	0	0	0	0	1	1	0	0
Miliolidae	0	0	0	0	1	3	0	0
Lagenidae	1	2	0	0	3	6	1	1
Polymorphinidae	3	5	0	0	2	4	0	0
Nonionidae	1	2	0	0	2	7	1	2
Heterohelicidae	0	0	0	0	1	1	1	1
Buliminidae	1	1	2	2	3	7	2	4
Rotaliidae	0	0	0	0	2	6	3	5
Cassidulinidae	1	1	0	0	1	5	1	4
Chilostomellidae	1	1	0	0	2	2	2	2
Globigerinidae	1	1	0	0	1	4	1	3
Anomalinidae	1	1	0	0	2	4	1	2
Total	10	14	4	5	25	57	15	26
Number of families	8		2		15		10	

Table 2. Showing the percentage of different species, varieties, and indeterminate species belonging to each family, in relation to the total number of different species, varieties, and indeterminate species in each bed.

	白岩層 Siroiwa Bed	牛ヶ首層 Usigakubi Bed	東山層 Higasiyama Bed	荒谷層 Araya Bed
Lituolidae	0	60	7	8
Textulariidae	0	0	4	0
Vernuilinidae	0	0	2	0
Valvulinidae	0	0	2	0
Miliolidae	0	0	5	0
Lagenidae	14	0	10	4
Polymorphinidae	36	0	7	0
Nonionidae	14	0	12	8
Heterohelicidae	0	0	2	4
Buliminidae	7	40	12	15
Rotaliidae	0	0	10	19
Cassidulinidae	7	0	8	15
Chilostomellidae	7	0	4	8
Globigerinidae	7	0	7	11
Anomlainidae	7	0	7	8



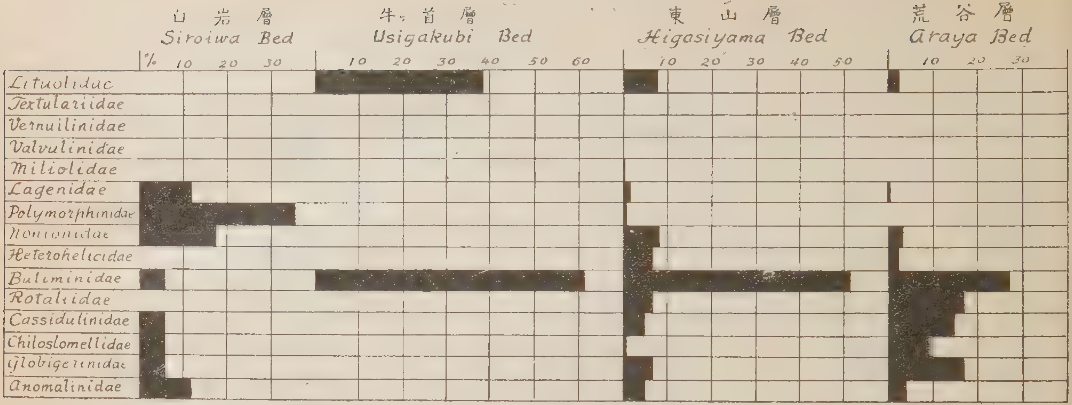
Text-Fig. 2. Showing the graphic interpretation of the table 2.

白岩層に於ては Polymorphinidae の種類が多い。第 21 (11) 圖版の表の中產出頻度 1–10, 10–50, 50–100, 100± に對して夫々 5, 30, 75, 150 の値を與へ, 各地層產の有孔蟲の科及び其の產出頻度を示せば第 3 表の通りである。各科の產出頻度の同一地層に於ける產出頻度の總和に對する百分率を第 3 圖に圖示して置いた。本層では Polymorphinidae が個體數に於いても優つてゐる。

西山油田の灰爪層の有孔蟲化石群, 卽ち所謂大桑 fauna に於いて其の有孔蟲化石群を特徵附ける要素である Miliolidae が灰爪層に對比される白岩層に發見されず, 又 Cassidulinidae も非常に少く, *Cassidulina yabei* ASANO and NAKAMURA が白岩層の Cassidulinidae を代表する唯一のもので, 又其の個體數も非常に少ないことは寧ろ奇異な感を與へる。然し今回採集した白岩層の材料の中, 有孔蟲を檢出したのは僅か 2 ヶ所であるので是等の科のものが白岩層の堆積當時に餘り生棲してゐなかつたか, 又採集地點附近の貝化石の保存の惡いことから或は二次的理由の爲是等のもの

Table 3. Showing the percentage of abundance of each family in the four beds.

	白岩層 Siroiwa Bed	牛ヶ首層 Usigakubi Bed	東山層 Higasiyama Bed	荒谷層 Araya Bed
Lituolidae	0	38.2	7.7	2.1
Textulariidae	0	0	0.3	0
Vernuilinidae	0	0	0.1	0
Valvulinidae	0	0	0.1	0
Miliolidae	0	0	0.4	0
Lagenidae	11.7	0	1.3	0.4
Polymorphinidae	35.3	0	0.8	0
Nonionidae	17.6	0	8.1	3.7
Heterohelicidae	0	0	6.2	2.5
Buliminidae	5.8	61.7	51.1	27.1
Rotaliidae	0	0	6.4	17.1
Cassidulinidae	5.8	0	4.6	15.0
Chilostomellidae	5.8	0	0.9	9.6
Globigerinidae	5.8	0	6.9	17.9
Anomalinidae	11.7	0	4.3	4.1



Text-Fig. 3. Showing the graphic interpretation of the table 3.

が少ないのか，今の處判斷しかねるので，直に Miliolidae 及び Cassidulinidae が白岩層の有孔蟲化石群には乏しいと結論することは困難である。

Polymorphinidae では *Guttulina austriaca* d'ORBIGNY, *Guttulina* sp. 3, *Sigmomorphina* sp. 5, *Sigmomorphina* sp. 6, *Polymorphina charlottensis* CUSHMAN が白岩層に限られ，是等は乏しい白岩層の有孔蟲化石群の中で，大桑 fauna の香りを僅かに有するものである。

Elphidium advenum (CUSHMAN) 及び *Elphidium* sp. 1 は他の種類と同様に個體數は極めて少ないが白岩層にだけ發見された。

牛ケ首層 Lituolidae と Buliminidae だけで材料が非常に少く，且つ採集地點 5 ケ所の中で有孔蟲を發見したのは本層の基底に近い 1 ケ所だけであるので此の材料で牛ケ首層の有孔蟲化石群を論ずることは甚だ危險であるから省略する。

東山層（椎谷層） 本層產有孔蟲 15 科の中 Nonionidae と Buliminidae が最も種類多く，次に Lagenidae と Rotaliidae が多い（第 2 圖參照）。產出頻度に就いて見れば Buliminidae が斷然他を壓して優勢である（第 3 圖參照）。Miliolidae 及び Cassidulinidae は種類に於いても，亦個體數に於いても極めて貧弱である。兩科のものは豫想に反し白岩層に於いても少なかつたが，是等が白岩層に本來乏しかつたと斷定出來ないことは前述の通りである。然るに東山層に於いては採集地點も多く且つ種類も可なりあるので，先づ今回の材料を以て本層の有孔蟲化石群の大勢を知ることが出來ると思はれるので，Miliolidae 及び Cassidulinidae の少ないことを東山層有孔蟲化石群の一つの特徴と見ることが出來るであらう。

次に主なものに就いて述べる。*Haplophragmoides* cf. *evoluta* NATLAND は本層の下部に發見され，殼は悉く壓力の爲變形してゐるが，大きな臍穴は *Haplophragmoides evoluta* NATLAND を思はせる特徴のあるものである。*Nonion pompilioides* (FICHTEL and MOLL) var. は本層の中，下部と荒谷層に存在し，特に東山層の下部に多い。*Bolivinita quadrilatera* (SCHWAGER) は本層の下部に發見され，特に產地 28 に於いては優勢である。本種は最近新潟縣三島郡島田村久田の灰爪層からも極く少數であるが發見した。Buliminidae が產出頻度に於いて非常に優勢であることは既に前に述べた通りであるが，本科の中で取分け個體數の多いのは *Uvigerina pygmaea* d'ORBIGNY (+*bifurcata*) である。產地 18, 19, 25, 30, 32, 33, 34 に於ける樣に 70 立方糎の母岩中に 100 個體以上產する處では一見すると他の種類が目に附かない程で，東山層有孔蟲群の中で非常に特徴のあるものである。

荒谷層　本層產有孔蟲 10 科の中，最も種類の多いのは Rotaliidae で，次に Buliminidae 及び Cassidulinidae が多い。Globigerinidae は白岩層及び東山層に比べ稍ゝ多く，全體の種數の 11% を占めて居る（第 2 圖參照）。產出頻度に就いて見ると Buliminidae が最も優勢で，次に Globigerinidae, Rotaliidae, Cassidulinidae の順に多い。Bulimidae は東山層に於いては他と比較にならない程優勢であるが，荒谷層に於いては左程目立つてゐない。Globigerinidae は個體數に於いても他の科より勝つてゐる（第 3 圖參照）。

種類の最も多い Rotaliidae の中で *Eponides* の仲間が多く，他の屬のものは極く少く僅に *Valvulineria* (?) sp. 及び *Rotalia* (?) sp. が存在するに過ぎない。產地 36 に於いては *Eponides haidingeri* (d'ORBIGNY), 產地 37 に於いては *Eponides tenerus* (BRADY) が可なり多く，特に產地 36 に於いては他の種類の個體數が割合に少いので目立つてゐる。Buliminidae では東山層と同様に *Uvigerina pygmaea* d'ORBIGNY (+*bifurcata*) が個體數に於いて勝れてゐる。產地 37 から多數檢出した *Cassidulina* sp. 2 は小型の特徴のある *Cassidulina* である。荒谷層の有孔蟲化石を檢出してゐると東山層に於ける場合よりも *Globigerina* の類が可なり目に附くが，特に產地 35 に於いては *Globigerina inflata* d'ORBIGNY が多數產し，他の種類の個體數が少ないので餘計目立つて見える。

荒谷層の有孔蟲化石群を白岩層及び灰爪層のものと比較すると，Miliolidae 及び Polymorphinidae の種類並に個體數が非常に少ないことが著しい點である。然し此のことは東山層と白岩層及び灰爪層とを比較した場合にも見られる點で，從つて荒谷層と東山層との間には甚しい差異は見出せない。僅かに認められる違ひは荒谷層に於いては Buliminidae 特に *Uvigerina pygmaea* d'ORBIGNY (+*bifurcata*) の產出頻度が東山層に於ける程際立つてゐないことと *Globigerina* が稍ゝ多いことである。

今回の調査の結果東山層及び荒谷層の有孔蟲化石群の大勢を知ることが出來たが，大桑 fauna の有孔蟲化石を多數發見出來るであらうと期待した白岩層からは案に相違して非常に僅かしか發見出來ず，又牛ケ首層からも極めて少數のものしか檢出出來なかつた。白岩層及び牛ケ首層に就いては東山油田の他の場所で採集，調査をしたいと思つてゐる。擱筆に當り今回調査の機會を與へられ色々御援助下さつた日本石油會社の大村一藏學士並に同社地質課の方々，文獻其の他に就き御援助下さつた東京帝國大學理學部地質學教室の鈴木好一學士，英文摘要の校閲の勞を取られた蜂須賀正氏侯爵に深謝の意を表する。

On the Foraminiferal Fauna of the Tertiary Sediments along the Nobe Valley, Niigata Prefecture

(Résumé)

By

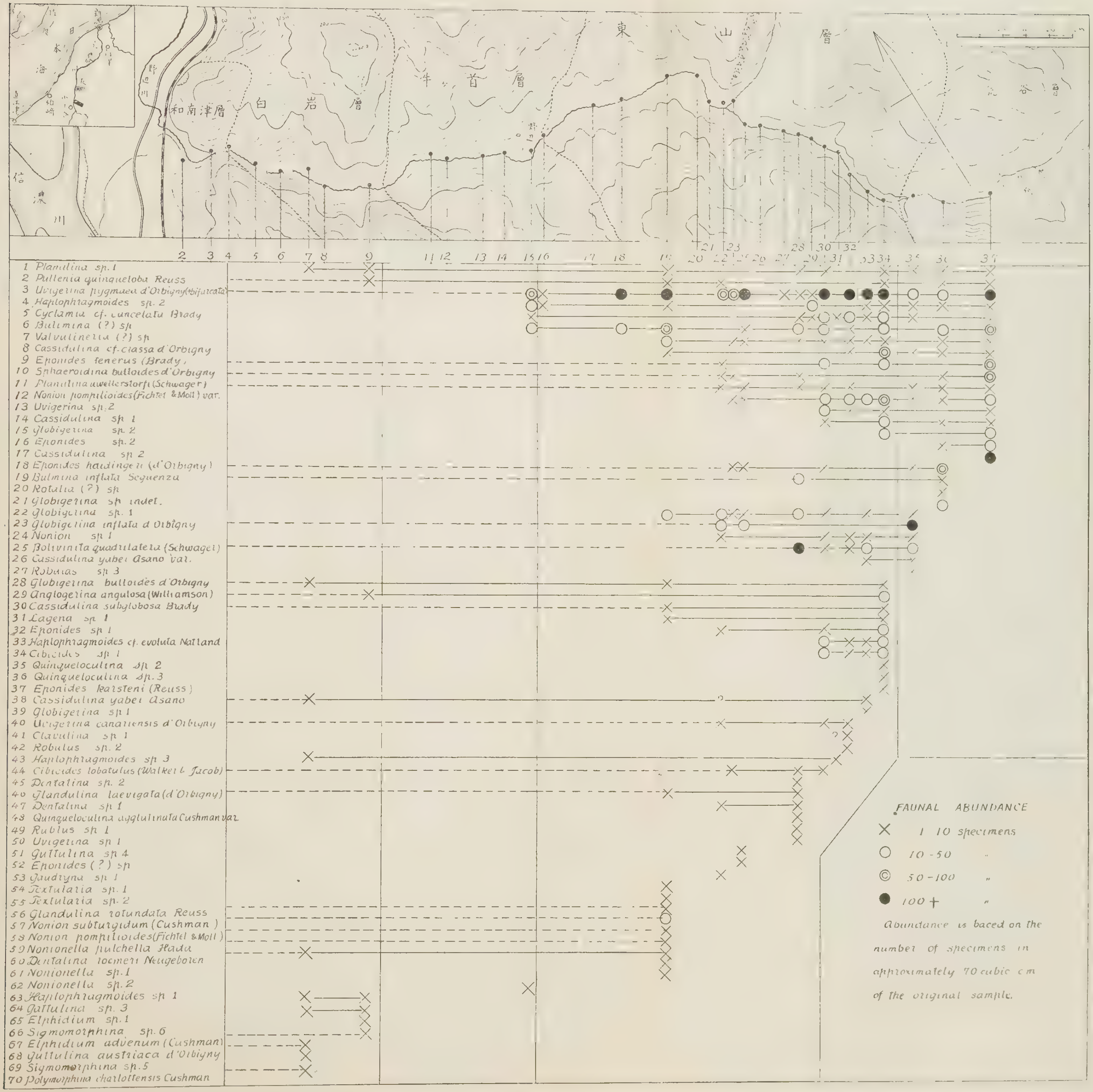
Tuneteru OINOMIKADO

The Nobe river takes its rise in the Nokogiri Mountain and flows into the Sinano river. The town of Oziya lies approximately 2 km. southwest of the mouth of the Nobe valley. Along this valley, there are good exposures of the Tertiary sediments which constitute the

Higasiyama Oil Field. Figure 1 shows a geological section along the valley. With the object of making a study of the variation in the micro-fauna, twenty samples containing foraminiferal fossils were collected along the valley. Of those twenty samples, two were collected from the Siroiwa Bed, one from the Usigakubi Bed, fourteen from the Higasiyama Bed, and three from the Araya Bed. No fossils were found in the Wanatu Bed within the valley, but the underlying sediments contained plentiful micro-fauna. Organisms were found to be most abundant in the more shaly beds.

The accompanying chart [Pl. 21 (11)] indicates localities and variations in micro-faunal content and the faunal abundance is shown by symbols on the legend of the chart. Horizontal lines have been drawn between the symbols of abundance in order to aid in recognizing zonal changes, and the dotted lines have been prepared to show the common species found in the Haizume Bed of Nisiyama Oil Field which is correlated to the Siroiwa Bed. of Nisiyama Oil Field which is colleated to the Siroiwa Bed.

Table 1 shows the number of families and genera, and the total number of different species, varieties, and indeterminable species in the Siroiwa, Usigakubi, Higasiyama, and Araya Beds. Table 2 shows the percentage of different species, varieties, and indeterminable species belonging to each family, in relation to the total number of different species, varieties, and indeterminable species in each bed. Figure 2 is a graphic representation of the data in this table. In order to give an idea of the relative abundance of the different families in each bed, a value is assigned to each symbol in the accompanying chart: × =5, ○= 30, ◎=75, ●=150. Table 3 shows the percentage of each family in the four beds. Figure 3 is a graphic representation of the data in Table 3.


東　山　層
牛　首　層
白　岩　層
和南津層
信濃川
日本海
2 3 4 5 6 7 8 9 11 12 13 14 15 16 17 18 19 20 21 22 23 25 26 27 28 29 30 31 32 33 34 35 36 37
1 Planulina sp. 1
2 Pullenia quinqueloba Reuss
3 Uvigerina pygmaea d'Orbigny (+bifurcata)
4 Haplophragmoides sp. 2
5 Cyclammina cf. cancellata Brady
6 Bulimina (?) sp.
7 Valvulineria (?) sp.
8 Cassidulina cf. crassa d'Orbigny
9 Eponides tenerus (Brady)
10 Sphaeroidina bulloides d'Orbigny
11 Planulina wuellerstorfi (Schwager)
12 Nonion pompilioides (Fichtel & Moll) var.
13 Uvigerina sp. 2
14 Cassidulina sp. 1
15 Globigerina sp. 2
16 Eponides sp. 2
17 Cassidulina sp. 2
18 Eponides haidingeri (d'Orbigny)
19 Bulimina inflata Seguenza
20 Rotalia (?) sp.
21 Globigerina sp. indet.
22 Globigerina sp. 1
23 Globigerina inflata d'Orbigny
24 Nonion sp. 1
25 Bolivinita quadrilatera (Schwager)
26 Cassidulina yabei Asano var.
27 Robulus sp. 3
28 Globigerina bulloides d'Orbigny
29 Anglogerina angulosa (Williamson)
30 Cassidulina subglobosa Brady
31 Lagena sp. 1
32 Eponides sp. 1
33 Haplophragmoides cf. evoluta Natland
34 Cibicides sp. 1
35 Quinqueloculina sp. 2
36 Quinqueloculina sp. 3
37 Eponides karsteni (Reuss)
38 Cassidulina yabei Asano
39 Globigerina sp. 1
40 Uvigerina canariensis d'Orbigny
41 Clavulina sp. 1
42 Robulus sp. 2
43 Haplophragmoides sp. 3
44 Cibicides lobatulus (Walker & Jacob)
45 Dentalina sp. 2
46 Glandulina laevigata (d'Orbigny)
47 Dentalina sp. 1
48 Quinqueloculina agglutinata Cushman var.
49 Rublus sp. 1
50 Uvigerina sp. 1
51 Guttulina sp. 4
52 Eponides (?) sp.
53 Gaudryina sp. 1
54 Textularia sp. 1
55 Textularia sp. 2
56 Glandulina rotundata Reuss
57 Nonion subturgidum (Cushman)
58 Nonion pompilioides (Fichtel & Moll)
59 Nonionella pulchella Hada
60 Dentalina roemeri Neugeboren
61 Nonionella sp. 1
62 Nonionella sp. 2
63 Haplophragmoides sp. 1
64 Guttulina sp. 3
65 Elphidium sp. 1
66 Sigmomorphina sp. 6
67 Elphidium advenum (Cushman)
68 Guttulina austriaca d'Orbigny
69 Sigmomorphina sp. 5
70 Polymorphina charlottensis Cushman
FAUNAL ABUNDANCE
× 1 10 specimens
○ 10-50 "
◎ 50-100 "
● 100+ "
Abundance is based on the number of specimens in approximately 70 cubic cm of the original sample.

90. *Fossil Cones of Balsam Fir from Sendai*

By

Seidô ENDÔ and Haruo OKUTSU

(Read February 18th; Received May 9th, 1938)

This report is based on many fossil cones of *Abies* discovered from Pliocene deposits of several localities in the environs of Sendai. These are so well preserved in the outer and inner features to admit detailed comparison with the living cones. The type specimen (Reg. No. 60914) and several others are stored in the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai.

Abies cf. *balsamea* (LINNÉ) MILLER

Pl. 22 (12), Figs. 1-6.

Description: Cones large, 9.5 to 12.5 cm long, and 3 to 3.8 cm wide, straight, cylindrical, but slightly narrowing upwards from the rounded base to rounded apex. Cone scales 4–5 in one cycle, closely imbricated, those of the middle portion about 2 cm long and 1.5–2 cm broad; outer margin entire and moderately curved, texture thin and leathery. Bract scales short and inclosed. Seminiferous scale embracing 2 seeds in hollow interior wall near base. Seed with thin membranaceous wing, small, elongate, 0.4 to 0.5 cm long, about 0.3 cm broad, inverted.

Remarks: These fossil cones closely resemble those of the balsam fir (*Abies balsamea* (LINNÉ) MILLER) now living in the eastern North America. Other plants with cones more or less similar in aspect are *Picea polita* CARR., *Abies firma* SIEB. et ZUCC., *A. laciocarpa* (HOOK) NUTT., *A. grandis* LINDL., *A. concolor* LINDL. et GORD., and *A. amabilis* FORB.; the first two species mentioned above are now living in Japan and the others in North America. But the present cones are different from those of the above named ones, except *A. balsamea*, in the size of cone, shape and arrangement of cone scales and concealed bract.

There are many records of fossil cones from the Cenozoic deposits of the various parts of the northern hemisphere which are similar at least in external aspect to the present one; to mention a few examples: *Abies* sp[1]. recently described by BROWN from the Miocene of Thunder Mountain, Idaho, *Abies laticarpus* MACGINITIE[2] from the Miocene of the Trout Creek beds of southern Oregon, *Picea lati-squamosa* LUDWIG[3] described by ENGELHARDT and KINKELIN from the Upper

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[1] BROWN, R. W.: Addition to Some Fossil Floras of the Western United States. U. S. Geol. Surv., Prof. Paper 186-J, p. 167, Pl. 46, fig. 1, 1937.

[2] MACGINITIE, H. D.: The Trout Creek Flora Southeastern Oregon. Carnegie Institute of Washington Publication, No. 416, p. 47, Pl. 3, fig. 6, 1933.

[3] ENGELHARDT, H. und Kinkelin, F.: Oberpliocäne Flora und Fauna des Untermaintales. Abhand. der Senckenb. Naturforsche. Ges., Bd. 29, Heft. 3, s. 212-213, Taf. 26, fig. 2a, b, 3a, b, 4a, b, 1908.

Pliocene "Klärbecken" near Frankfurt, *Pinus plutonis* BAILY[1] described by BAILY from the Miocene of Antrim, Ireland, *Pinus abies rotunde-squamosa* LUDWIG[2] from the Tertiary "Späteisenstein" of Westerwald, *Pinus medullosa* LUDWIG[3] from the middle stage of the "Wetterau-Rheinischen Tertiär Formation" near Frankfurt. These differ from the present one in one or other way, or precise comparison is hindered by incomplete preservation.

Abies balsamea has a wide geographical distribution on the continent of North America; northwards it extends far into ths Domain of Canada, where it is common in the eastern provinces from Newfoundland to Lake Superior, and southwards into the Alleghanies and southwest Virginia.

The fossil cones are found in tuffaceous shale of the Tatunokuti sandy shale or of the Lower lignite beds, both Lower Pliocene in age; the shale contains usually also fragments of lignite and leaves of *Abies* and *Torreya*. The localities are:

1. Hyô-zyô-gawara, Sendai, collected by H. SONE (Tatunokuti sandy shale: the Lower Pliocene in age).
2. Tatunokuti gorge, Sendai, collected by S. ENDÔ (Tatunokuti sandy shale).
3. Sanjyûnin-mati, Sendai, collected by H. OKUTSU (Tatunokuti sandy shale).
4. Okubusi, Osawa-mura, Miyagi-gun, Miyagi prefecture, collected by H. OKUTSU (Lower lignite beds: the Lower Pliocene in age).
5. 1 km west from Kami-Sinden, Osawa-mura, Miyagi-gun, collected by H. OKUTSU (Lower lignite beds).

Finally the present authors wish to acknowledge their warmest thanks to Prof. H. YABE of Tôhoku Imperial University, for kindly correcting and making possible the publication of this short note.

Explanation of Plate 22 (12)

Fig. 1. *Abies balsamea* (L.) MILLER. ×1
Collected by S. SONE from Hyô-zyô-gawara, Sendai (Tatunokuti Sandy Shale).
Fig. 2, 3, 4. Impressions of Fig. 1. ×1
Fig. 5. *Abies balsamea* (L.) MILLER. ×1
Collected by H. OKUTSU from Sanzyûnin-mati, Sendai (Lower Lignite Beds).
Fig. 6. *Abies balsamea* (L.) MILLER. ×1
Collected by H. OKUTSU from Kamisinden, Osawa-mura, Miyagi-gun, Miyagi-prefecture (Lower Lignite Beds).

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[1] BAILY, W. H.: Notice of Plant-remains from Beds interstratified with the Basalt in the Country of Antrim. Quart. Journ. Geol. Soc. London, Vol. 25, pp. 357–362, figs. 1, a, b, 1869.

[2] LUDWIG, R.: Fossilen Pflanzen aus dem tertiären Spatheisenstein von Montabauer. Palaeont. 8, s. 169–170, Taf. LXV, figs. 1, 3, 3a, 4, 9, 1859–1891.

[3] LUDWIG, R.: Fossilen Pflanzen aus der Mitteren Etage der Wettaraurheinischen Tertiär-Formation. Palaeont. 5, s. 137, Taf. XXVIII, fig. 4a, 1855–1858.

仙臺產 *Abies* 屬化石毬果（摘要）

遠藤誠道・奥津春生

筆者等は仙臺附近の龍の口砂質頁岩層及下部埋木層（下部鮮新世）より採取せる多數の化石毬果を研究せる結果，本化石毬果は現在北米東部に自生してゐる「バルサムモミ」*Abies balsamea* (L.) Mill. に最も近似のものである事を證する事が出來た。

日本古生物學會記事

Proceedings of the Palaeoutological Society of Japan

昭和 14 年 6 月 17 日 日本古生物學會第 15 回例會を東京帝國大學理學部地質學教室に於て開催す（參會者 22 名）。講演者並に講演題目次の如し。

北支大同炭田口泉鎭統の化石に就て　藤本治義

On the Indentity of *Echigophyllum* YABE and HAYASAKA (1924) and *Amygdallophyllum* VUN and BENSON (1920): with the Description of *A. giganteum* Y. et H.　Ichiro HAYASAKA

Discovery of *Hexaphyllia* in the Lower Carboniferous of Japan.　Hisakatsu YABÉ and Toshio SUGIYAMA

Vicarya のある標本に就て（代讀）　池邊展生

上野松坂屋新館地下から採集された貝化石其他に就て　大塚彌之助

An Interesting Mode of Occurrence of a Cirriped from the Miocene of Tyôsen.（代讀）　Kotora M. HATAI

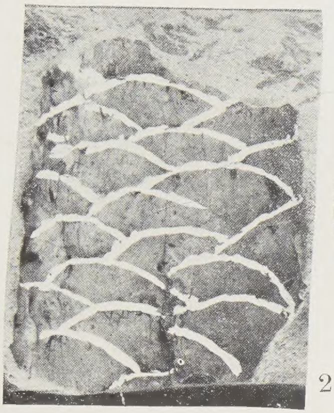
On the Occurrence of *Coronula* from the Kakegawa Series in Tôtômi, Japan.（代讀）　Kotora M. HATAI

特に興味ある南鮮寒武利亞紀三葉蟲二三に就て　小林貞一

Some Fossil Maples from the Far-East.（代讀）　Seidô ENDÔ

昭和 14 年 3 月 31 日以降 6 月 30 日迄の會員移動次の如し。

入會者　湊正雄　井上武
退會者　木原二莊　小岩井兼輝（死亡）　牧野孝三郎



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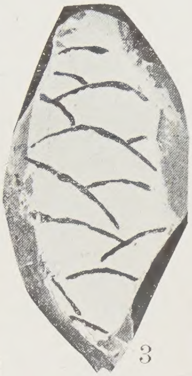

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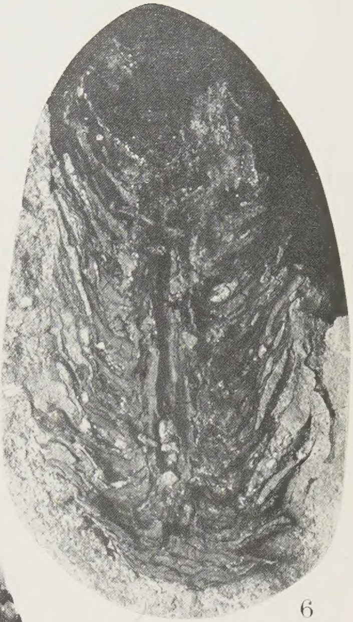

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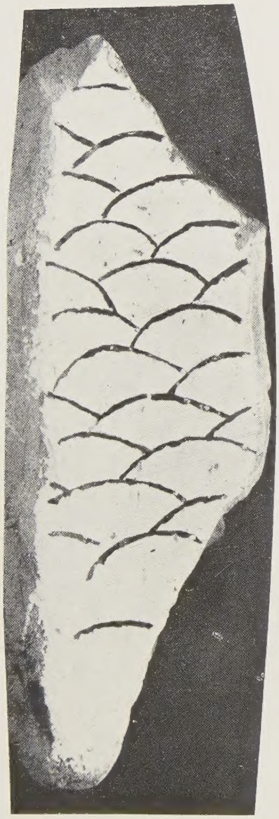

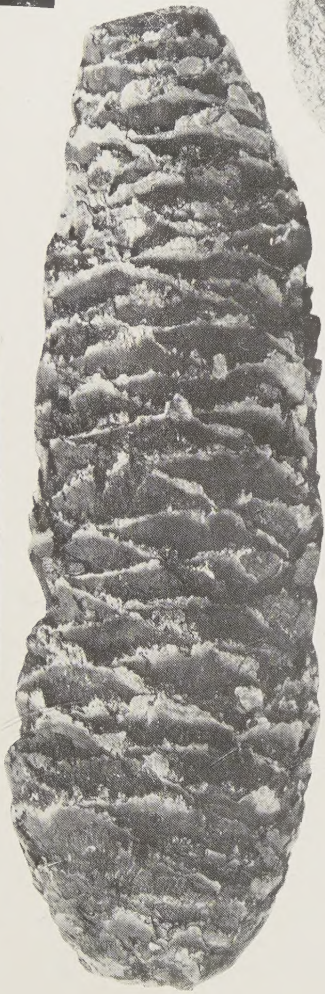

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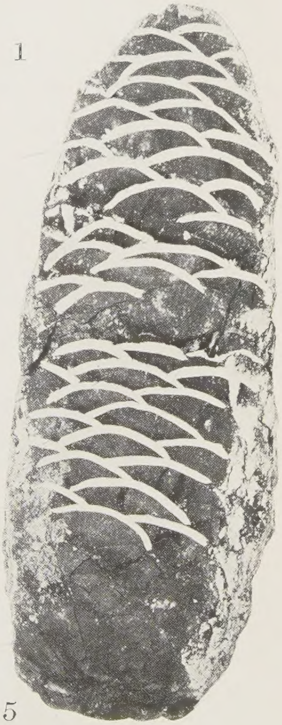

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日本古生物學會規則

1. 本會ハ日本地質學會ノ部會ニシテ日本古生物學會ト稱ス
2. 本會ハ古生物學及ビ之レニ關スル諸學科ノ進歩ヲ助ケ斯學ノ普及ヲ圖ルヲ以テ目的トス
3. 本會ハ第2條ノ目的ヲ達スルタメニ總會及講演會ヲ開ク
4. 本會ノ紀事及ビ會員ノ寄稿ハ地質學雜誌ニ掲載シ, 其ノ別刷ヲ日本地質學會々員ニアラザル本會々員ニ配布ス
5. 本會ノ會費ハ年額3圓トシ, 日本地質學會々員ハ年額1圓トス, 但シ一時ニ金100圓以上ヲ寄附セル者ヲ賛助會員ニ推ス
6. 本會ニ次ノ役員ヲ置ク

    會長　1名
    評議員　數名

7 役員ノ任期ヲ1年トシ會員中ヨリ總會ニ於テ選擧ス

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事務所——編輯所
東京帝國大學理學部地質學教室
日本古生物學會
(振替口座東京第84780番)

Constitution of the Palaeontological Society of Japan.

Article 1. The Society shall be known as the Palaeontological Society of Japan. It forms a section of the Geological Society of Japan.

Article 2. The object of the Society is the promotion of palaeontology and related sciences.

Article 3. This Society to execute the scheme outlined under Article 2, shall hold annual meetings and discussions.

Article 4. Proceedings of the Society and articles for publication shall be published through the Journal of the Geological Society of Japan. Separates and circulations will be sent to members of the Palaeontological Society who are not members of the Geological Society of Japan.

Article 5. The annual dues of this Society is two dollars for the foreign members of the Society.

Article 6. This Society shall hold the following executives. President one person, Councillors several persons.

Article 7. The President and Councillors shall be elected annually. The President and Councillors shall be elected from the Society body by vote of its members. All elections shall be ballot.

President Ichizô ÔMURA

Councillors Ryuji ENDÔ
Haruyosi HUZIMOTO*
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Teiichi KOBAYASHI*
Takumi NAGAO*
Tuneteru OINOMIKADO*
Yanosuke OTUKA*
Shigeyasu TOKUNAGA*
Hisakatsu YABE*
Ichirô HAYASAKA
Tsunenaka IKI
Nobuyasu KANEHARA
Rokurô KIMURA
Hanzô MURAKAMI
Shintarô NAKAMURA
Ichizô ÔMURA
Iwao TATEIWA
Kyukichi WATANABE
Shinji YAMANE*

(* Executive committee)

All communications relating to this Journal should be addressed to the
PALAEONTOLOGICAL SOCIETY OF JAPAN
Geological Institute, Faculty of Science, Imperial University of Tokyo, Japan